4228

Diaphus brachycephalus Taaning

Diaphus brachycephalus Taaning,

Vidensk. Medd. Dansk Naturh. Foren. Kjöbenhavn, vol. 86, 1928, p. 59. North Atlantic (diagnosis in key).

dorso-nasal luminous organ separated from ventro-nasal (suborbital) luminous organ; 2 suborbital luminous organs, posterior behind hind edge of lens, anterior organ reaching nostril;

photophores large, intervals between small; anals 4 or 5 + 4; third supraanal and posterolateral placed low, about equidistant from lateral line and

ventral row of photophores.
Suprapectoral spot without luminous scale.

D. 13 or 14; A. 13 or 14. (Jaaning.)

North Atlantic. Form short.

4230

Diaphus longleyi new species

Depth 3 1/4; head 2 3/5, width 2 1/4. Snout 7 2/3 in head; eye 3, greater than snout or interorbital; maxillary extends well beyond eye though not quite to slightly inclined hind premaxillary edge, slender, length 1 2/5 in head; interorbital 3 7/8, moderately high and convex. Gill rakers 10 + 13, lanceolate, uppermost 3 rudimentary, others 1 2/3 in eye or twice gill filaments.

Scales 29 in lateral line to caudal base and 2 more on latter, little enlarged; 3? above, 3 below, 10? predorsal to occiput. Rather large pointed

scale in ventral fin axil 1/3 of fin. Few small scales on caudal base.

Rather large luminous organ along lower front eye edge, also suprorbital veiled photophore and one on medio-inferior eye edge; 2 opercular, upper larger and in line with lower eye edge and pectoral fin origin, lower veiled behind lower hind maxillary end; 3 veiled branchiostegals; 5 pectorals, first interspace longest, fourth photophore higher than upper subpectoral or opposite interspace between third and fifth pectorals; 1 suprapectoral over second pectoral about level with

supraventral, little behind pectoral fin origin; 2 subpectorals, nearly equidistant in inclined series including first pectoral, with upper close before bases of lowest pectoral rays; 5 ventrals, second and third progressively higher, third about same level as fourth pectoral, first indistinctly within pectoral base; 1 supraventral at lower 2/5 in space between lateral line and first ventral; 4 + 3 anals, posteroanals behind anal fin base; 3 supraanals in inclined line from first to third or uppermost, first but little elevated from fifth ventral, second

midway in series to third, which well below lateral line or over anal fin origin or little before first anteroanal; 2 posterolaterals, form continuous arch with last 3 anteroanals, uppermost at same level below lateral line as upper superoanal; 4 precaudals, arched along lower borders of caudal lobe basally, equidistant, uppermost at same level below lateral line as uppermost supraanal and posterolateral. Infracaudal luminous plate extends from anal base to caudal. Small white luminous blotch below supra-pectoral photophore.

D. III, 8, I, first branched ray 2 in head; adipose fin length 4 1/3; A. III, 9, I, first branched ray 4 1/5; caudal 1 1/2, well forked; least depth of caudal peduncle 3 1/8; pectoral 2 3/4; ventral 1 2/3.

Brown, skin where scales have fallen dusted finely with dusky. Adherent scales with silvery white reflections and iridescent tints. Iris and sides of head similar. Fins whitish, bases of dorsal and caudal blackish.

Diagnosis. Related to Diaphus intermedius Borodin but differs in the larger lower antorbital luminous body and but 3 postanal photophores in place of 5.

Type — No. U.S.N.M.

Diaphus diadematus Tåning resembles this species in its luminous orbital organs, though it has 5 + 5 anal photophores, its supra-pectoral over or before the pectoral origin and well before the second pectoral photophore.

D. 5229. Talong Island (E.), S. 17° W., 5.75 miles (N.L. at. 10°48'45" E. Long. 124°21'15"), between Cebu and Leyte. In 290 fathoms. May 7, 1908. Length 38 mm.

4236

Diaphus intermedius Borodin

Diaphus intermedius Borodin, Proc. New England Zool. Club, vol. 11, Jan. 10, 1930, p. 89. N. 33° W. 64°, 1200 meters; Bull. Mus. Comp. Zool., vol. 72, no. 3, Aug. 1931, p. 75 (type and paratype listed).

Depth 4 1/3; head 3, width 2.
Snout 6 1/3 in head; eye 3, greatly exceeds snout, greater than interorbital; maxillary extends half an eye diameter behind eye though not quite to little inclined hind preopercle edge, slender, length 1 1/2 in head; interorbital 3 2/5, slightly convex. Gill rakers 8+15, lanceolate, slender, 1 1/2 in eye; ~~2/5~~ gill filaments 2/5 gill rakers.

Scales (pockets) 33 in lateral line to caudal base, little enlarged; 3.? above, 4.? below, 10 predorsal forward to occiput. Caudal base scaly. Scales very caducous, most all fallen.

A small antorbital luminous organ, faces forward, supraorbital, nearly 1/3 of pupil; long antero-infraorbital luminous organ at front half of eye, narrowing posteriorly; 2 opercular photophores, upper larger, in line with lower eye edge and pectoral fin origin, lower photophore close behind hind maxillary end; 3 equidistant veiled branchiostegals, largely obscured by large luminous bodies; 5 pectorals, first interspace longest, fourth photophore little behind and over third or elevated level with

upper subpectoral; 1 suprapectoral,
slightly below middle in space
between lateral line and pectoral
fin origin; 2 subpectorals, in
oblique line with first pectoral,
first or lower subpectoral little
nearer upper, which also little
before suprapectoral close before
bases of lowest pectoral fin rays;
5 ventrals, second and third
progressively higher from first,
third about level with upper
subpectoral and fourth pectoral;
1 supraventral, slightly below
middle in space below lateral

line to ventral fin base; 6 + 4
anals, first anteroanal elevated
until little below median supraanal,
close before second anteroanal,
posteroanals behind anal fin base;
3 supraanals in inclined line
from close behind last ventral,
first or lowest little nearer last
ventral than median, uppermost
close below lateral line opposite
front of anal; 1 posterolateral,
above and close behind last
anteroanal; 4 precaudals, in
slight arc at bases of lower rudimentary
caudal rays with fourth little

above middle below lateral line. Small luminous body below suprapectoral photophore.

D. III, 10, I, first branched ray 2 1/8.? in head; adipose fin 4; A. III, 10, I, first branched ray 3 1/5.?; caudal damaged, forked; least depth of caudal peduncle 3; pectoral 3 4/5; ventral 1 1/2.

Brown, edges of body and few remaining scales blackish, with purplish or violaceous tints. Iris dusky to blackish. Fins pale to whitish.

89906 U.S.N.M. N. Lat. 33° W.
Long. 64°. Iselin Cruise 1929. Station
322. Museum of Comparative Zoology.
Length 70 mm. Paratype. Agrees in
all the photophores with Diaphus
borisgi except the lower infraorbital.
There are, however, 2 luminous antorbital
bodies, the upper section a small one
above the nostril and the lower
a much larger triangular one along
lower front eye edge.

4243

Diaphus rafinesquii (Cocco)

Hychtophus rafinesquii Cocco, Nuovi Ann. Sci. Nat. Bologna, vol. 2, 1838, p. 180, pl. 7, fig. 7. Messina.

— Canestrini, Fauna d'Italia, Pesci, 1874, p. 125 (Sicily). — Raffaele, Mitth. Zool. Stat. Neapel, 1889, p. 183, pl. 7, fig. 7.

→ [illegible], p. 710 (Mediterranean; Messina). —
→ Carus, Prodrom. Fauna Medit., vol. 2, 1893, p. 564 (compiled).

↑ Scopelus rafinesquii Holt and Byrne, Dep. Agric. Techn. Instruct. Ireland, Sci. Invest., 1910, No. 6 (1911), p. 22, fig. 6 (Irish Atlantic slope, 730 fathoms).

[illegible]; Messina). — Borodin, Bull. Vanderbilt Oceanogr. Mus., vol. 1, art. 1, 1928, p. 11 (Panama, Pacific).

Myctophum (Hychtophus) rafinesquei Brauer, Zool. Anzeiger, vol. 28, No. 10, Dec. 20, 1904, p. 393 (diagnosis in key).

Myctophum (Diaphus) rafinesquei Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15,

Diaphus rafinesquii (Cocco)

Nychtophus rafinesquii Cocco, Nuovi Ann. Sci. Nat. Bologna, vol. 2, 1838, p. 180, pl. 7, fig. 7. Messina.

Scopelus rafinesquii Valenciennes, Hist. Nat. Poiss., vol. 21, 1849, p. (compiled).

— Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 410 (Mediterranean; Messina). — Carus, Prodrom. Fauna Medit., vol. 2, 1893, p. 564 (compiled).

Lobianchia rafinesquei Goode and Bean, Oceanic Ichth., 1895, p. 88, pl. 26, fig. 100 (West Atlantic; Messina). — Borodin, Bull. Vanderbilt Oceanogr. Mus., vol. 1, art. 1, 1928, p. 11 (Panama, Pacific).

Myctophum (Nyctophus) rafinesquei Brauer, Nr. 10, Dec. 20.

Zool. Anzeiger, vol. 28, 1904, p. 393 (diagnosis in key).

Myctophum (Diaphus) rafinesquei Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15,

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Tiefsee-Fische, 1906, p. 223, text figs. 144-145 (Messina). — Murray and Hjort, The Depths of the Ocean, 1912, p. 613, fig. 461 (N. 36°52' W. 39°55'; N. 48°4' W. 32°25').

Diaphus rafinesquei Garr, Bull. Bingham Oceanog. Coll., No. 5, vol. 2, A. 7, 1918, p. (27) 83, figs. 33-34 (Mediterranean and Atlantic); Vidensk. Medd. Dansk Naturh. Foren. Kobenhavn, vol. 86, 1928, p. 60 (diagnosis in key).

Diaphus nanus, Diaphus theta, Myctophum protoculus). — Fowler, Occas. Pap. Bishop Mus., vol. 9, No. 18, Feb. 1932, p. 4 (reference).

Diaphus theta Eigenmann and Eigenmann, Proc. California Acad. Sci., Ser. 2, vol. 3, March 1890, p. 4. Point Loma, San Diego, California. — Goode and Bean, Oceanic Ichth., 1895, pp. 89, 512 (reference). — Jordan and Evermann, Bull. U. S. Nat. Mus.,

4244

Tiefsee-Fische, 1906, p. 223, text figs. 144-145 (Messina). — Murray and Hjort, The depths of the Ocean, 1912, p. 613, fig. 461 (N. 36°52' W. 39°55'; N. 48°4' W. 32°25').

Diaphus rafinesquei Garr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. (119) 131, text figs. 25 (photophores), 26 (profile) (N. 23° to 32° W. 64° to 77°, 7000 to 1000 feet); Proc. U. S. Nat. Mus., vol. 76, art. 10, 1929, p. 32 (types of Diaphus nanus, Diaphus theta, Myctophum protoculus). — Fowler, Occas. Pap. Bishop Mus., vol. 9, no. 18, Feb. 1932, p. 4 (reference).

Diaphus theta Eigenmann and Eigenmann, Proc. California Acad. Sci., ser. 2, vol. 3, March 1890, p. 4. Point Loma, San Diego, California. — Goode and Bean, Oceanic Ichth., 1895, pp. 89, 512 (reference). — Jordan and Evermann, Bull. U. S. Nat. Mus.,

No. 47, pt. 1, 1896, p. 564 (off Point Arena, California, in 455 fathoms).

↑ Myctophum (Myctophus) theta Brauer, Zool. Anzeiger, vol. 28, Nr. 10, Dec. 20, 1904, p. 393 (diagnosis in key).

Myctophum (Diaphus) theta Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 165 (diagnosis in key).

Mukuhiva, Marquesas Islands, Mem. Carnegie Mus., vol. 6, No. 2, Aug. 1913, p. 87 (off Kinsin and Hondo, in 300 fathoms).

— Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (types).

Diaphus holti Taaning, Rep. Danish Oceanogr. Exped., No. 5, vol. 2, Biology A. 7, 1918, pp. (27) 88, figs. 35–36. Mediterranean

No. 47, pt. 1, 1896, p. 564 (off Point Arena, California, in 455 fathoms).

Lugetophum protoculus Gilbert, Proc. U.S. Nat. Mus., vol. 13, July 1890, p. 52. Off Washington coast, in 584 fathoms.

Diaphus manus Gilbert, Mem. Mus. Comp. Zool., vol. 26, No. 6, 1908, p. 224, pl. 1. Near Mukuhiva, Marquesas Islands, 300 fathoms; Mem. Carnegie Mus., vol. 6, No. 2, Aug. 1913, p. 87 (off Kinkin and Hondo, in 300 fathoms).

— Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (types).

Diaphus holti Taaning, Rep. Danish Oceanogr. Exped., No. 5, vol. 2, Biology A. 7, 1918, pp. (27) 88, figs. 35–36. Mediterranean

length 2 in head from snout tip;
teeth minute, uniserial in jaws,
also uniserial on very narrow band
on vomer and palatines. Scales 70
in lateral line to caudal base and
2 more on latter. D. IV or V, 10 to 12;

and Bay of Cadiz; Vidensk. Medd. dansk naturh. Foren, Kjöbenhavn, vol. 86, 1928, p. 60 (North Atlantic and Mediterranean; diagnosis in key).

1928.

Diaphus mollis Taaning, Videnska.
Medd. Dansk. Naturh. Foren. Kjöbenhavn,
vol. 86, 1928, p. 60. North Atlantic;
diagnosis in key.

Depth 3 3/4 to 4 1/4; head 3 to 3 1/4,
width 2 1/8 to 2 1/5. Snout in profile 7 1/2 to
9 1/2 in head; eye 3 1/8 to 3 2/5, greater than
snout or interorbital; maxillary reaches
well beyond eye though not quite to
oblique hind preopercle edge, slender,
length 1 2/5 to 1 2/3 in head; interorbital
3 1/2 to 3 2/3, convex. Gill rakers 5 to 7 + 13 to 16,
lanceolate, 1 1/3 to 1 1/2 in eye; gill filaments
2/5 gill rakers.

Scales 36 in lateral line to caudal base and 2 more on latter, enlarged or not; narrowly imbricated, simple tubes well developed though little exposed; 3 above, 3 below, 9 to 11 predorsal forward to occiput. Scales adherent, firm. Caudal base scaly. Ventral axillary scale 3/4 in fin. Scales with 3 basal radiating striae and 5 or 6 irregular marginals apically; circuli rather fine.

Antorbital luminous organ small or large, with lower section much larger and extending along first half of lower eye edge, followed by small photophore just behind eye center, also smaller photophore above upper section of antorbital luminous organ; 2 opercular

photophores, upper much larger, conspicuous and on inclined line? from lower eye edge and pectoral fin origin or upper subpectoral; lower opercular veiled, opposite or behind rictus; 3 equidistant veiled branchiostegals, 5 pectorals, first interspace longest, second interspace shortest, fourth photophore over or little behind third and nearly or even little above same level last upper or pectoral fin origin over pectoral fin origin, subpectoral, / suprapectoral, midway to lower third between lateral line and pectoral fin origin; 2 subpectorals, first or lower about midway in inclined line from first pectoral to upper subpectoral, which close before lowest pectoral fin ray bases;

4250

5 ventrals, progressively higher from first to third which attains level of fourth or upper opercular pectoral; 1 supraventral, about midway to lower 2/5 between lateral line and ventral fin base; 5 + 5 or 6 anals, first anteroanal sometimes little elevated, posteroanals all behind anal fin base; 3 supraanals, in inclined plane or arc from last ventral, first and second equidistant or equidistant with last ventral, third supraanal sometimes little more separated or higher, though well below lateral line or falling over anal fin origin; 1 posterolateral over and behind last anteroanal at same level as uppermost

supraanal; 4 precaudals arched progressively from first or lowest with last behind end of lateral line at same level as uppermost supraanal and posterolateral. Small rounded luminous organ below suprapectoral photophore.

D. IV, 9, I, 1 or III, 10, I, first branched ray 1 1/3 to 2/3 in head; adipose fin 3 1/3 to 3 3/4; A. III, 10, I or III, 11, I, first branched ray 2 1/4 to 2 2/5; caudal (damaged) forked; least depth of caudal peduncle 2 3/5 to 3; pectoral 2 to 2 2/5; ventral 1 3/4 to 2.

Skin brown, scale pockets darker. Fins pale, evidently whitish.

Atlantic and Pacific Oceans.

101700 U.S.N.M. No data. Length 87.? mm.

33550 U.S.N.M. N. 37° W. 68°

Albatross Station .

Length 68 to 78 mm. 2 examples.

40058 U.S.N.M, Messina.

Florence Museum. Length 51 to 83 mm. 8 examples.

~~41914 U.S.N.M. Point Loma, California. Dr. C. H. Eigenmann. Length 37 to 53 mm. Type (larger) and paratype of Diaphus theta.~~

41914 U.S.N.M. Point Loma, California. Dr. C. H. Eigenmann. Length 37 to 53 mm. Type (larger) and paratype of Diaphus theta.

41922 U.S.N.M. San Diego, California. Dr. C. H. Eigenmann. Length 37 to 58 mm., caudal tips damaged. Paratypes of Diaphus theta. Very poorly preserved.

44290 U.S.N.M.

Albatross Collection ( ). Length 67 mm., caudal tips damaged. Type of Lyctophum protoculus.

49382 U.S.N.M. Messina. M. Bellotti. Length 81 mm.

Tiefsee-Fische, 1906, p. 223, text figs. 144-145 (Messina).

Diaphus rafinesquei Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. (119) 131, textt figs. 25 (photophores), 26 (profile) (Atlantic materials); Proc. U.S. Nat. Mus., vol. 76, 1929, p. 32 (types of Diaphus rarus, Diaphus theta, Myctophum (Protoscelus)).

Diaphus rarus Gilbert, Mem. Mus. Comp. Zool., vol. 26, no. 6, 1908, p. 224, pl. 1. Near Nukuhiva, Marquesas Islands; Mem. Carnegie Mus., vol. 6, no. 2, Aug. 1913, p. 87 (off Kinkiu and Kondo, in 300 fathoms). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (types).

Diaphus holti Taaning, Rep. Danish Oceanogr. Exped., no. 5, vol. 2, Biology A. 7,

4254

60277 U.S.N.M.

Albatross Collection (4267). ~~Other~~ ~~examples, tota~~ Length 60 mm., caudal tips damaged.

74644 U.S.N.M.

Albatross Collection (5063). Length 12 to 33 mm., caudal tips damaged. 4 examples.

74647 U.S.N.M.

Albatross Collection (451). Length 11 to 41 mm. 6 examples.

75765.

Albatross Collection (3998). Length 14 mm. Type of Diaphus nanus.

4 examples with 33503 U.S.N.M. N. 39°44'30" W. 71°4', 1022 fathoms: Albatross Collection (2090). September 21, 1883. Length 32 to 42 mm: Ex Myctophum mülleri.

1 example with 49357 U.S.N.M. Messina, Italy. M. Bellotti. Length 70 mm:

2801. D.5363. Cape Santiago Light, S.79° W., 4.5 miles (N.13° 47'20" E.120° 43'30"), Balayan Bay, Luzon. In 180 fathoms. February 20, 1909. Length 150 mm.

D.5301. China Sea, vicinity of Hong Kong (N.20° 37' E.115° 43'). In 208 fathoms. August 8, 1908. Length 80 to 113 mm. 4 examples.

2276, 2277. D.5409. Capitancillo Light, N.19° W., 22 miles (N.10° 38' E.124° 13' 08"), Dupon Bay (Leyte) and vicinity. In 189 fathoms. March 18, 1909. Length 158 to 172 mm.

2228 to 2230. D.5566. Dammi Island (N.), S.67° W., 6.8 miles (N.5° 52 1/2" E.120° 31'), between Jolo and Tawi Tawi. In 244 fathoms. September 21, 1909. Length 144 to 190 mm.

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Diaphus anteorbitalis Gilbert

Diaphus anteorbitalis Gilbert, Mem. Carnegie Mus., vol. 6, No. 2, Aug. 1913, p. 92, pl. 12, fig. 1. N. Lat. 33° 24' 50". E. Long. 135° 38' 40", in 253 fathoms (off Shiro Misaki). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 119 (compiled); Proc. U.S. Nat. Mus., vol. 76, 1929, p. 41 (type).

Lamprotta anteorbitalis Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 156 (Misaki).

Depth 4 1/4 to 4 1/3; head 3 2/5 to 3 1/2, width 2 to 2 1/5. Snout 5 to 6 1/5 in head; eye 3 2/5 to 3 4/5, greater than snout, 1 to 1 1/8 in interorbital; maxillary reaches well beyond eye, not quite opposite well inclined hind preopercle edge, slender, length 1 2/7 to 1 4/5 in head; interorbital 3 2/3 to 3 3/4, convex. Gill rakers 5 + 11, lanceolate, 1 1/3 in eye, twice gill filaments.

Scales 35 in lateral line to caudal base and 1 more on latter, not enlarged, tubes simple, moderate; 4 above, 4 below, 13 predorsal to occiput. Axillary ventral scale 1/3 of fin. Caudal base scaly. Scales with 5 basal and 5 apical radiating striae; circuli moderate.

Antorbital luminous organs as long narrow supraorbital along front half of eye above with small anterior section above nostril, along front and lower orbital edges another similar narrow one with its front upward extension still narrower; 2 opercular photophores, upper larger and on line with lower eye edge and upper subpectoral, lower veiled and close behind hind end of maxillary; 3 equidistant veiled branchiostegals; 5 pectorals, first interspace greatest, fourth photophore behind and above third or almost level with upper subpectoral; 1 suprapectoral, midway between lateral line and pectoral fin origin, little before upper subpectoral

or little behind lower subpectoral;
2 subpectorals, first or lower
in line midway between first
pectoral and upper subpectoral,
which close before bases of lowest
pectoral fin rays; 5 ventrals,
progressively higher from first to
third which about same level
as fourth pectoral, interspace
between third and fourth greatest;
6 + 5 or 6 anals, first and sixth
anteroanals elevated, posteroanals
all behind anal fin base; 3
supraanals in inclined line from
first or lowest behind last
ventral, second supraanal little
higher than first anal though
little nearer first or lower supraanal
than upper, most of which below

lateral line over anal fin origin;
1 posterolateral, above and behind
last anteroanal though below
lateral line; 4 precaudals in
arc progressively from first or
lower first before caudal origin
and uppermost little more
distant than others below and
behind end of lateral line.

Skin brown, sprinkled with
minute dark dots, especially
where scales have fallen and
scale pockets all darker. Sides
of head and adherent scales
with silvery tints and iridescent
reflections. Orbital luminous
organs yellowish. Fins whitish,
dorsal and caudal darks basally,
articulations of fin rays finely dusky.

4261

Japan.

74471 U.S.N.M.

Albatross Collection (4968). Length 109 mm., caudal damaged. Type.

74502 U.S.N.M.

Albatross Collection (4968). 2 examples. Length 96 to 108 mm., caudal damaged. Paratypes.

4262

Diaphus adenomus Gilbert

Diaphus adenomus Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 592, pl. 68, fig. 1. Kaiwi Channel between Oahu and Molokai, in 335 to 350 fathoms; off southern Oahu, in 265 to 280 fathoms; near Kauai, in 318 to 364 fathoms. — Jordan and Jordan, Mem. Carnegie Inst., vol. 10, no. 1, dec. 1922, p. 12 (reference). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 119 (compiled). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (Hawaii). — Parr, Proc. U. S. Nat. Mus., vol. 76, 1929, p. 41 (type).

4763

Depth 4 to 4 1/2; head 3 1/5 to 3 2/3, width 2 to 2 1/2. Snout 6 to 9 in head from snout tip; eye 4 to 4 3/4, greater than snout, 1 1/4 to 1 1/2 in interorbital; maxillary reaches well beyond eye though not quite to well inclined hind preopercle edge, slender, length 1 1/4 in head from snout tip; interorbital 2 7/8 to 3 1/2, convex. Gill rakers 5 + 13, lanceolate, 1 1/4 in eye; gill filaments 3/5 of gill rakers.

Scales 35 or 36 in lateral line to caudal base, not enlarged; 4 above, 5 below, 14 predorsal forward to occiput. Scales very caducous, all fallen.

Caudal base apparently scaly.
Antorbital luminous organs large, upper section large and lower section similar, occupies whole front. 3/5 of lower eye edge; 2 opercular photophores, upper little larger, on line with lower eye edge and upper subpectoral; branchiostegals veiled, as 3 large, luminous areas, second little nearer third; 5 pectorals, first interspace longest, fourth photophore elevated on line with upper subpectoral and third ventral; 1 suprapectoral over pectoral fin origin or about lower 2/5 in space between lateral line and pectoral fin origin; first or lower subpectoral midway

in line between first pectoral and
and upper subpectoral, last
close before bases of lowest pectoral
rays; 5 ventrals, equidistant;
/ supraventral, midway between
ventral fin base and lateral
line; 6+5 anals, first and
sixth anteroanals elevated,
second and fifth less so, thus
form complete arc to posterolateral;
3 supraanals in vertical inclined
line from behind fifth ventral,
first or lowest and second
closest, though median little
higher than first anteroanal
and third or uppermost close
below lateral line little before
anal fin origin; / posterolateral,
little behind and above last

anteroanal, interspace greater than between fifth and sixth anteroanals; 4 precaudals in arc at lower caudal base, uppermost about 2/5 in space below lateral line. Large white luminous body below and behind suprapectoral. Female with 4 infracaudal luminous scales. Caudal fin with rather large whitish luminous area at base of each caudal lobe.

D. III, 11, I, first branched ray 1 2/5 in total head length; adipose fin 3 1/8 to 3 1/4; A. III, 12, I, first branched ray 2 to 2 1/3?; caudal (damaged) subequal with head; least depth of caudal peduncle 2 4/5 to 2 7/8;

4267

pectoral 2 7/8 to 3; ventral 1 2/5 to 1 3/5.

Dark brown, scale pockets and fin base dusky or darker. Iris gray, evidently silvery white in life. Interorbital blackish, with rather large diffuse median whitish area. Blackish bar over narrow infraorbital area.

Hawaiian Islands.

4268

51515 U.S.N.M.

Albatross Collection (4106). Length
73 mm. Paratype.
51588 U.S.N.M.

Albatross Collection (4106). Length
150 mm., to ends of broken caudal
tips. Type.

4269

Diaphus macrophus Parr

Diaphus macrophus Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 136, fig. 27. N. 24°11' W. 75°35'; 7500 feet, Bahamas.

Depth 4 1/8; head 3 2/5. Snout 5 1/2 in head; eye 2 1/2, greater than snout; maxillary extends 1/2 eye diameter behind eye, length 1 1/4 in head; interorbital high.

Antorbital luminous organs large, upper circular, lower extends above nostril and along lower eye edge before pupil; 2 opercular, upper level with lower eye edge; 5 ventrals, first interval longest, fourth elevated close below level of upper subpectoral and over interval between third and fifth pectorals; 2 subpectorals in line with first pectoral, equidistant; 5 ventrals, in inclined line from first

to third; 1 suprapectoral, nearer pectoral origin than lateral line; 1 supraventral little nearer ventral fin base than lateral line; anals 6+5, first anteroanal level with median supraanal, last anteroanal little elevated, posteroanals behind anal base; 3 supraanals in slightly inclined line, first and second closer and third 2 eye diameters below lateral line; 1 posterolateral 2 diameters below lateral line; 4 precaudals arched at caudal base, upper close below end of lateral line. Suprapectoral with luminous scale.

D. 15; A. 15; pectoral 11; ventral 8. Length 27 mm. without caudal. (Parr.)

Bahamas.

Diaphus mondi new species

depth 3 3/4 to 4; head 2 4/5 to 3 2/5, width 2. Snout 6 to 7 in head; eye 4 to 4 1/4, greater than snout, 1 1/3 to 1 3/5 in interorbital; maxillary reaches well behind eye not reaching well inclined hind preopercle edge, slender, length 1 2/5 to 1 1/2 in head; interorbital 3, convex and convexly elevated. Gill rakers 6+12, lanceolate, equal eye; gill filaments 2/3 gill rakers.

Scales 30 in lateral line, not enlarged, with prominent tubes; 3 above, 4 below. Ventral with pointed axillary scale 1/2 fin length. Caudal base

well scaled. Scales very caducous, all fallen.

Large antorbital organ well above upper eye edge; 2 opercular photophores, lower opposite hind terminal end of maxillary; 5 pectorals, first interspace longest, fourth spot close behind third and slightly above upper subpectoral; 1 suprapectoral, midway between lateral line and pectoral fin origin; 2 subpectorals, first or lower but little below upper or midway between first pectoral and upper subpectoral, which close before lower median pectoral ray bases; 5 ventrals, third over second and

little above level of upper pectoral fin edge, fourth little behind and midway in line with third and fifth; 1 supraventral, about upper third in space between lateral line and ventral base; 5 to 6 + 4 or 5 anals, first anteroanal close before second or slightly below level of second supraanal, posteroanals all behind anal fin base; 3 supraanals, first low and close before anal origin, second slightly below middle of first supraanal and third or uppermost which close below lateral line; 2 posterolaterals, first or lower close

behind and above last anteroanal and upper close behind and below lateral line; 4 precaudals in slight arc progressively on base of lower caudal lobe, upper moderately below end of lateral line. Large luminous organ close below and behind suprapectoral.

D. III, 12, I, first branched ray 1 1/4 to 1 2/5 in head; adipose fin 3 to 3 1/5; A. III, 13, I, first branched ray 1 3/5 to 2; caudal 1 1/8 to 1 1/5, well forked; least depth of caudal peduncle 3 to 3 1/4; pectoral 2 2/5 to 2 7/8; ventral 1 3/5 to 1 3/3.

Skin brown, where scales have fallen pale brown, scale pockets darker.

Preorbital and pectoral luminous organs cream white. Iris dark gray, likely silvery in life. Fins whitish.

Diagnosis. Greatly like Diaphus metopoclampus (Cocco), known only from the Mediterranean and Atlantic. It differs, however, in much fewer postanal photophores, my examples with but 4 or 5 on each side.

Type No. U.S.N.M.

D.5497. Bantigui Island, N.64°W., 10 miles (N.9°7'15" E.124°59'30"), between Leyte and Mindanao. In 960 fathoms. August 3, 1909. Length 42 mm.

D. 5504. Macabalan Point Light (Mindanao), S. 39° E., 6 miles (N. 8°35' 30" E. 124° 36'), northern Mindanao. In 200 fathoms. August 5, 1909. Length 75 mm.

D. 5190. Pescador Island, S. 9° E., 10.70 miles (N. 10° 8' 15" E. 123° 16' 45"), Tanon Strait, east coast of Negros. In 295 fathoms. March 31, 1908. Length 75 to 78 mm. 2 examples.

Diaphus metopoclampus (Cocco)
Nychtophus metopoclampus Cocco,
Giorn. Sci. Let. Art. Sicil., vol. 26,
no. 77, 1829, p. 144. Messina; Nuovi
Ann. Sci. Nat. Bologna, vol. 2, 1838,
p. 24, pl. 5, fig. 8.

Nyctophum metopoclampum Cocco,
Iris, vol. 24, 1831, p. 1342 (Messina).
— Bonaparte, Icanogr. Fauna Italica,
Pesc., vol. 3, pt. 1, fasc. 27, 1840, descr.
pl. fig. 3 (Italy).

Nyctophum (Nyctophus) metopoclampum
Brauer, Zool. Anzeiger, vol. 28, 1904,
p. 394 (diagnosis in key).

Myctophum (Diaphus) metopoclampum Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 225, fig. 147 (Messina).

Scopelus metopoclampus Valenciennes, Hist. Nat. Poiss., vol. 22, 1849, p. 442 (Messina; Algeria).

Scopelus metopoclampus Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 409 (compiled). — Canestrini, Fauna d'Italia, Pesci, 1874, p. 123 (Sicily). — Carus, Prod. Faun. Medit., vol. 2, 1893, p. 564 (compiled).

Scopelus (Myctophus) metopoclampus Lütken, Kgl. Danske. Videnskb. Selsk. Skrift. Kjöbenhavn, vol. 7, 1892, p. 258 (Bonaparte specimen).

Aethoprora metopoclampa Goode and Bean, Oceanic Ichth., 1895, p. 86, pl. 27, fig. 101 (Messina). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 570 (Bonaparte specimen).

Diaphus metopoclampus Taaning, Vidensk. Medd. Dansk naturh. Foren. Köbenhavn, vol. 86, 1928, p. 61 (North Atlantic; Mediterranean). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. (137) 137, fig. 28 (N. 24° to 32° W. 64° to 77°, 5000 to 10000 feet).

4280

Diaphus metaclampus Borodin, Bull. Mus. Comp. Zool., vol. 72, No. 3, Aug. 1931, p. 76 (N. 47°40' W. 37°20', 600 fathoms; error).

Depth 3 1/2; head 3 2/5, width 1 3/4. Snout in profile 7/13 in head; eye 2 3/5, greatly exceeds snout or interorbital; maxillary extends back moderately behind eye though not quite to hind preopercle edge, slender, length 1 2/7 in head; interorbital 5, convex, very declivous. Gill rakers 8 + 18, lanceolate, slender, 1 2/5 in eye, gill filaments 1 2/3 in eye.

Scales 30 in lateral line, not enlarged, tubes large and simple; 3 above, 4 below, 10 predorsal to occiput. Caudal base scaly. Scales very caducous, most all fallen.

Very large antorbital luminous organ covering whole front of very declivous snout, 2 supraorbital lobes of which inner greatly larger, lower marginal along front eye edge and posteriorly far as hind pupil edge with upper extension to nostril equally wide; 2 opercular photophores, upper level with lower eye edge, lower little smaller than upper and behind end of maxillary;

3 veiled equidistant branchiostegals;
5 pectorals, first interspace greatest
and fourth photophore behind third
pectoral and little above level of
upper subpectoral; 1 suprapectoral,
above upper fourth in space between
lateral line and pectoral fin origin,
white luminous organ below twice its
diameter; 2 subpectorals, upper close
before bases of lowest pectoral rays,
first or lower midway in line from
first pectoral and uppermost subpectoral;
5 ventrals, progressively higher from
first to third which over and little
before fourth at about same level as

pectoral fin origin; 1 supraventral, over first ventral about upper third in space between lateral line and level of pectoral fin origin; 6+6 anals, first elevated though not quite high as median supraanal and well before second anteroanal; posteroanals behind anal fin base; 3 supraanals in inclined line from first or lowest which little behind last ventral up to uppermost little below lateral line and opposite anal fin origin, median slightly nearer lower or on same level as third ventral; 1 posteriolateral, below lateral line opposite break in anals; 4 precaudals

inclined upward from first which low at front of lower caudal lobe to highest little behind and below end of lateral line.

D. III, 11, I, first branched ray 1 1/10 in head; adipose fin 3 3/4; A. III, 12, I, first branched ray 1 3/4; caudal damaged, evidently forked; least depth of caudal peduncle 2 1/2; pectoral 2 1/8; ventral 1 1/2.

Skin brown, with dusky or darker scale pockets. Sides of head and adherent scales with silvery white reflections. Preorbital luminous organs yellowish. Iris silvery white. Fins whitish-

4285

Atlantic Ocean.

44169 U.S.N.M. Messina, Italy. Dr.
H. H. Gigliolo. Length 53 mm.

pectoral fin origin; 1 supraventral, over first ventral about upper third in space between lateral line and level of head and adherent scales with silvery white reflections. Preorbital luminous organs yellowish. Iris silvery white.

4486

Diaphus effulgens (Goode and Bean

Myctophum (Myctophus) effulgens Brauer, Zool. Anzeiger, vol. 28, Nr. 10, Dec. 20, 1904, p. 393 (diagnosis in key).

Myctophum (Diaphus) effulgens Brauer, Deutsch Tiefsee Exped. Valdivia, vol. 15, Tiefsee Fische, 1906, p. 165 (diagnosis in key).

→

Diaphus effulgens Parr, Bull. Bingham

— Taaning, Vidensk. Medd. dansk naturh. Foren Köbenhavn, vol. 86, 1928, p. 62 (diagnosis in key). —

Zool., vol. 72, No. 3, Aug. 1931, p. 76 (N. 32°50' W. 64°18', 1500 meters).

4486

Diaphus effulgens (Goode and Bean)

Aethoprora effulgens Goode and Bean,
Oceanic Ichth., 1895, p. 87, pl. 27, fig. 103.
Trow cod on Brown's Bank; N. Lat. 19°
45' W. Long. 75° 4'; in 1639 fathoms.

→ Diaphus effulgens Parr, Bull. Bingham
Oceanogr. Collection, vol. 3, art. 3, 1928, p.
20 (compiled); Proc. U.S. Nat. Mus., vol. 76, 1929,
p. 42, fig. 20 (type). — Borodin, Bull. Mus. Comp.
Zool., vol. 72, no. 3, Aug. 1931, p. 76 (N. 32° 50'
W. 64° 18', 1500 meters).

gham Oceanogr. Collection, vol. 3, art. 3, dec.
8, p. 85 (note).

—135) (Atlantic; Bay of Bengal; south
of Ceylon; north of Chagos Archipelago;
west and east of Seychelles).

depth 3 7/8; head 3 1/4, width 1 7/8. Snout 6 3/4, 9/5 in profile; eye 3, greater than snout or interorbital; maxillary reaches little beyond eye though not quite to hind preopercle edge, slender, length from snout tip 1 1/2 in head; interorbital 5, convex. Gill rakers 6 + 14, lanceolate, 2 in eye, subequal with gill filaments.

Scales 37 in lateral line to caudal base and 1 more on latter, enlarged; 3 above, 4 below, 10 predorsal to occiput. Scales with 4 basal radiating striae and 6 apical less perfect; circuli fine, complete.

4288

Two large, fused antorbital luminous organs, supero-orbital about 1/3 of infero-orbital, also with smaller outer section or supraorbital 1/4 of inner section; 2 opercular photophores, upper larger and just above line from lower eye edge and pectoral fin origin, lower minute and veiled, close behind hind maxillary end; 5 pectorals, first interspace greatest, fourth photophore behind and elevated slightly below level of upper subpectoral; 1 suprapectoral, about lower third between lateral line and pectoral fin origin, with moderate white luminous body below; 2 subpectorals, first

median
or lower in line with first pectoral
and upper subpectoral, last
close before and partly below
base of lowest pectoral fin
rays; 5 ventrals, progressively
higher from first to third, which
little above level with fourth
pectoral; 1 supraventral, about
midway below lateral line and
ventral fin origin; 6 + 5 anals,
first slightly above level with
median supraanal, second little
lower and sixth little higher than
fifth, posteroanals all behind
anal fin base; 3 supraanals,
slightly inclined in row from
first or lowest close behind
fifth ventral to third or uppermost
well below lateral line, median

little nearer first than uppermost; 1 posterolateral well below lateral line, little posterior to sixth anteroanal; 4 precaudals, progressively arched from first along lower edge of caudal base up towards, though well below end of lateral line.

D. IV, 12, I, first branched ray 1 2/5 in head; adipose fin 5 3/4; A. III, 12, I, first branched ray 2; caudal (damaged) forked; least depth of caudal peduncle 2 4/5; pectoral 2; ventral 1 3/5.

Light brown, with traces of silvery reflections. Iris yellowish white with gray. Antorbital luminous organs buff golden. Fins pale brownish.

4291

43770 U. S. N. M. Brown's Bank.
Gloucester. Donation. Length 135
mm. to end of damaged caudal.

Diaphus chrysorhynchus Gilbert and Cramer

Diaphus chrysorhynchus Gilbert and Cramer, Proc. U. S. Nat. Mus., vol. 19, 1896, p. 409. N. Lat. 21°15'49" W. Long. 159°44'27"; Diaphus makaxxni. — Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 592 (off Kannakakai, Molokai; off Honolulu; off north west Oahu, in 253 to 282 fathoms). — Jordan and Jordan, Mem. Carnegie Mus., vol. 10, no. 1, dec. 1922, p. 12 (reference). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, dec. 1928, p. 120 (compiled). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (compiled). — Parr, Proc. U. S. Nat. Mus., vol. 76, 1929, p. 37, figs. 17-18 (type).

Myctophum (Diaphus) chrysorhynchum Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 5, Tiefsee-Fische, 1906, p. 164 (diagnosis in key).

Myctophum fibulatum (not Gilbert and Cramer p. 411) Gilbert and Cramer, Proc. U. S. Nat. Mus., vol. 19, 1896, pl. 38, fig. 2 (wrongly transposed)—

Depth 4 1/4 to 4 4/5; head 3 1/3 to 3 2/5, width 2 1/8 to 2 1/5. Snout 6 to 8 in head; eye 3 to 3 1/2, greater than snout or interorbital; maxillary extends well back of eye though not quite to well inclined preopercle edge, slender, length 1 1/3 to 1 2/5 in head; interorbital 4 1/8

to 4 1/2, convex. Gill rakers 7+15, lanceolate, slender, 2 in eye, subequal with gill filaments. Scales 34 in lateral line to caudal base and 2 more on latter, not enlarged, tubes simple, distinct; 3 above, 4 below, 10 or 11 predorsal to occiput. Pointed axillary ventral scale 2 in fin. Caudal base scaly. Scales with 9 to 11 basal radiating striae and as many apically; circuli fine, complete.

Large antorbital luminous organ, upper section extending well over nostril and as supraorbital, lower narrower and larger extending well along most of lower front eye edge; 2 opercular

photophores, upper larger and in inclined line from lower eye edge to upper subpectoral, lower veiled and behind rictus; 3 veiled branchiostegals; 5 pectorals, first interspace longest, fourth photophore over and little posterior from third and nearly level with upper subpectoral; 1 suprapectoral about upper third in space between lateral line and pectoral fin origin, little before upper subpectoral; 2 subpectorals, first or lower midway in line from first ventral and upper-most subpectoral, last close before and below lowest pectoral fin ray bases; 5 ventrals, first 3 progressively elevated in inclined

plane so last about level with fourth pectoral and little before fourth ventral, last interspace greatest; / supraventral midway between lateral line and ventral fin origin; 6 + 5 or 6 anals, first anteroanal elevated above level of first supraanal though not quite so high as second, before first anteroanal and last anteroanal also little elevated from fifth, posteroanals all behind anal fin; 3 supraanals in slightly inclined line from behind last ventral, first and second closer and third or uppermost close below lateral line opposite vent; / posterolateral close below lateral line little behind last anteroanal; 4

equidistant precaudals in arc progressively higher along base of lower caudal lobe, uppermost close below end of lateral line.

D. III, 13, I or III, 14, I, first branched ray 1 1/5 to 1 1/4 in head; adipose fin 3 1/2 to 3 3/4; A. III, 12, I or III, 13, I, first branched ray 1 3/4 to 2; caudal (damaged well forked; least depth of caudal peduncle 3; pectoral 2 1/5 to 2 2/3; ventral 1 3/5 to 1 4/5.

Body dark brown where scales have fallen, sprinkled with minute dark dots. Antorbital luminous organ brilliant golden. Adherent scales and sides of head with silvery white tints

and variously iridescent. Fins all pale brown.

Hawaiian Islands.

70219 U.S.N.M. N. 21° 10' 30" W. 157° 48' 30". Albatross Collection (3471). December 4, 1891. Length 61 to 78 mm. 2 examples.

47710 U.S.N.M.

Albatross Collection. Length 78 to 98 mm. 6 examples. Type (largest) and paratypes.

Diaphus perspicillatus (Ogilby)
Æthoprora perspicillata Ogilby, Proc.
Linn. Soc. New South Wales, vol. 23,
1898, p. 36. Lord Howe Island. —
Waite, Records Austral. Mus., vol. 5,
1904, p. 149, pl. 18, fig. 1 (type).
Diaphus perspicillatus Norman, Ann.
Mag. Nat. Hist., ser. 10, vol. 4, Nov. 1929,
p. 512 (Lord Howe Island).

4300

Myctophum (Myctophus) elucens Brauer,
2n.10, Dec.20, (393)
Zool. Anzeiger, vol. 28, 1904, p. 401, fig.
Indian Ocean, ~~N. Lat. 0° 27' 4" E. Long. 42°~~
~~47' 3", 638 meters.~~

7.

Myctophus (Diaphus) elucens Brauer,
Tiefsee
Deutsch. Typed. Valdivia, vol. 15, Tiefsee-
from S. 0°27'4" E. 42°47'3"; 638 meters
Fische, 1906, p. 219, text fig. 140 (type).

Diaphus elucens Parr, Bull. Bingham
Oceanogr. Collection, vol. 3, art. 3, Dec. 1928,
p. (121) 138 (discussion). — Borodin, Bull. Mus.
Comp. Zool., vol. 72, No. 3, Aug. 1931, p. 76 (N. 32°50' W. 64°18', 1500 meters).
Diaphus gigas Gilbert, Mem. Carnegie Mus.,
vol. 6, No. 2, Aug. 1913, p. 93, pl. 12, fig. 2.
Nagami Bay. — Jordan and Thompson, Mem.
Carnegie Mus., vol. 6, No. 4, Sep. 1914, p. 213
(Nagami Bay).

T.? Diaphus fragilis Taaning, Videnskb. Meedd. Dansk. Naturh. Foren. Kjöbenhavn, vol. 86, 1928, p. 61 (diagnosis in key).

Dec. 1928, p. 120 (part).

Depth 3 7/8; head 3 1/6. Snout 10 2/5 in head; eye 3, greatly exceeds short snout; maxillary extends nearly eye diameter behind eye, slender, length 1 1/4 in head; interorbital moderately high.

Two antorbital luminous organs, one very small and superior on upper eye edge little anterior, other a broad

Diaphus effulgens (not Goode and Bean) Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, dec. 1928, p. 120 (part).

Depth 3 7/8; head 3 1/6. Snout 10 2/5 in head; eye 3, greatly exceeds short snout; maxillary extends nearly eye diameter behind eye, slender, length 1 1/4 in head; interorbital moderately high.

Two antorbital luminous organs, one very small and superior on upper eye edge little anterior, other a broad

mass along whole front eye edge; 2
opercular photophores, upper larger
and in line with lower eye edge and
fourth pectoral spot; 3 branchiostegals;
5 pectorals, first interval greatly
longest, fourth spot elevated level
with pectoral fin origin rather close
behind third pectoral in vertical;
1 suprapectoral slightly nearer pectoral
fin origin than lateral line; 2
subpectorals, in slightly inclined
line with first pectoral, first
median in position and second or

upper close before bases of lower pectoral rays ; vi vertical with suprapectoral ; D 7 ventrals, second slightly higher than either fourth pectoral or first supraanal ; 1 supraventral, little nearer ventral base than lateral line ; anals 6 + 4, first and last anteroanals elevated though first little lower than median supraanal ; posteroanals behind anal fin base ; 3 supraanals, in nearly straight inclined line passing behind last ventral, median

much closer to first than to upper or third which close below lateral line; 1 posterolateral close below lateral line behind last anteroanal in vertical; 4 precaudals, first 3 close together and low, fourth much higher posteriorly little below end of lateral line. Large luminous scale below suprapectoral.

D. III, 11, first branched ray 1 3/4 in head; adipose fin 3 3/4; A. III, 11, first branched ray 2 1/4; caudal 1 1/4, forked; least depth of caudal peduncle

2 4/5; pectoral 3; ventral 1 3/4.

Length 39 mm. (Brauer.)

Pacific and Indian Oceans.

Gilbert's type of Diaphus gigas is 172 mm. long and seems to vary only in minor characters from Brauer's account and figure. He gives scales 35 in lateral line and gill rakers 8 + 16.

4306

Diaphus lucidus (Goode and Bean)

Aethoprora lucida Goode and Bean,

Oceanic Ichth., 1895, p. 87, pl. 27, fig. 102.

N. 19°45' W. 75°4', 1639 fathoms.

Myctophum (Myctophus) lucidum Brauer,

Zool. Anzeiger, vol. 28, No. 10, Dec. 20, 1904, p. 393

(diagnosis in key).

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† Myctophum (Diaphus) lucidum Lea. Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 164 (diagnosis in key). Denhaw,

diagnosis in key). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. (121) 141, fig. 31 (N. 23° to 24° W. 76° to 77°, 4000 to 8000 feet); Proc. U. S. Nat. Mus., vol. 76, 1929, p. 44 (type).

4306

Diaphus lucidus (Goode and Bean)

Aethoprora lucida Goode and Bean,
Oceanic Ichth., 1895, p. 87, pl. 27, fig. 107.
N. 19°45' W. 75°4', 1639 fathoms.

Myctophum (Myctophus) lucidum Brauer,
Zool. Anzeiger, vol. 28, (no. 10, Dec. 20,) 1904, p. 393
(diagnosis in key).

Diaphus lucidus Taaning, Videnska.
Medd. dansk naturh. Foren. Köbenhavn,
vol. 86, 1928, p. 62 (north Atlantic;
diagnosis in key). — Parr, Bull.
Bingham Oceanogr. Collection, vol. 3, art.
3, dec. 1928, p. (121) 141, fig. 31 (N. 23° to
24° W. 76° to 77°, 4000 to 8000 feet); Proc.
U. S. Nat. Mus., vol. 76, 1929, p. 44 (type).

Norman, Ann. Mag. Nat. Hist., ser. 10,
. 4, Nov. 1929, p. 514 (Zanzibar; north c
miralty Island; between Admiralt
land and Papua). — Parr, Proc. U.
t. Mus., vol. 76, 1929, p. 11 (types of

→ diagnosis in

Diaphus lucid

Medd. Dansk

vol. 86, 1928, p

diagnosis in

Depth 4 1/8; head 3 3/5, width 1 4/5.
Snout 8 4/5 in head; eye 4 1/5, greater
than snout, 1 1/3 in interorbital;
maxillary extends 1 1/3 eye diameters
behind eye though not quite to inclined
hind preopercle edge, slender, length
1 1/3 in head; interorbital 3 3/4, convex.
Gill rakers 5+12, lanceolate, slender,
1 1/2 in eye, equal gill filaments.

Scales 39 in lateral line, enlarged;
3 above, 5 below, 14 predorsal
forward to occiput. Caudal base
scaly. Scales very caducous, most all
fallen.

Large antorbital luminous organ

supraorbital, faces forward, nearly large as pupil and narrow as seen in profile; another large antorbital luminous organ almg greater front eye edge; 2 opercular photophores, upper in line with lower eye edge and pectoral fin origin, lower veiled and behind hind maxillary end; 3 equidistant veiled branchiostegals; 5 pectorals, first interspace longest, third behind fourth and elevated level with pectoral fin origin; 1 suprapectoral, slightly behind pectoral fin origin. about upper 2/5 in space between lateral line and pectoral fin origin;

2 subpectorals, first or lower midway between uppermost subpectoral and first pectoral, upper close before pectoral fin base medianly; 5 ventrals, second and third progressively higher with third elevated little above pectoral fin origin; 1 supraventral, about upper third between lateral line and ventral fin base; 7+6 anals, anteroanals bowed towards anal base with first spot slightly lower than median supraanal and last above first posteroanal, posteroanals behind anal fin base; 3 supraanals, first or lowest little above and behind

fifth ventral, second at lower third between first and uppermost which close below lateral line; 1 posterolateral close below lateral line, behind last anteroanal; 4 precaudals arched along lower caudal lobe basally, first lowest and fourth rather close below end of lateral line. Rather large luminous body below suprapectoral photophore.

D. III, 14, I, first branched ray 1¼? in head; adipose fin 3¾; A. IV, 13, I, first branched ray 1⅘?; caudal 1⅕?, forked; least depth of caudal peduncle 3; pectoral 2½?; ventral 1¾.

Brown, rather pale and evidently faded. Iris dark gray. Fins whitish.

Atlantic Ocean.

44084 U.S.N.M. N. 19°45' W. 75°4'.

In 1639 fathoms. Albatross Collection (2127). Length 108 mm.

Diaphus caeruleus (Klunzinger)
Scopelus caeruleus Klunzinger, Verhandel.
zool. botan. Gesell. Wien, vol. 21, 1871, p.
572. Red Sea.

Scopelus (Nyctophus) coeruleus Lütken,
Kon. Danske Videnska. Selsk. Skrift.
Kjöbenhavn, ser. 6, vol. 7, 1892, p. 260, fig.
20 (type).

Lampanyctus coeruleus Goode and Bean,
Oceanic Ichth., 1895, pp. 81, 512 (compiled).

Nyctophum (Nyctophus) coeruleum Brauer,
Zool. Anzeiger, vol. 28, nr. 10, Dec. 20, 1904, p. 392
(compiled; diagnosis in key).

Nyctophum (Diaphus) coeruleum Brauer,
Deutsch. Tiefsee Exped. Valdivia, vol. 15,

4313

Tiefsee-Fische, 1906, p. 217, text fig. 137 (1 S. 0°43'2" E. 98°33'8", 371 meters, west coast of Sumatra).

Diaphus coeruleus Weber, Siboga Exped., vol. 57, Fische, 1913, p. 88 (Molucca Passage, in 1500 meters). — Gilbert, Mem. Carnegie Mus., vol. 6, no. 2, Aug. 1913, p. 94 (Sagami Bay; cotypes of Diaphus watasei). — McCulloch, Biol. Results Endeavour, vol. 5, pt. 4, June 8, 1926, p. 160, pl. 13, figs. 1-2 (Great Australian Bight, in 200 to 450 fathoms). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 122 (compiled).

Diaphus caeruleus Weber and Beaufort, Fishes Indo Austral. Archipelago, vol. 2,

1913, p. 168 (fig. 65 b on p. 171) (Molucca Passage, to 1500 meters). — Jordan and Thompson, Mem. Carnegie Mus., vol. 6, no. 4, Sep. 1914, p. (Tagami Bay).

Scopelus engraulis Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 197, pl. 51, fig. C. Philippines, in N. Lat. 6°47' E. Long. 122°28', in 250 fathoms. — Alcock, Ann. Mag. Nat. Hist., ser. 6, vol. 8, 1891, p. 129 (Andaman Sea, in 188 to 220 fathoms); Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 333 (reference); descript. Cat. ~~Deep Sea Fishes~~ Deep Sea Fishes ~~in the Indian Museum~~ Indian Mus., 1899, p. 161 (Andaman sea materials).

Depth 4 1/2 to 5; head 3 2/5 to 3 1/2, width 2 1/5 to 2 1/4. Snout 5 1/2 to 6 in head; eye 3 4/5 to 4 1/4, greater than snout, 1 1/5 to 1 1/3 in interorbital; maxillary reaches 1 to 1 1/2 eye diameters behind eye though not quite to moderately inclined hind preopercle edge, slender, length 1 1/3 to 1 2/5 in head; interorbital 3 2/5 to 3 1/2, broadly convex. Gill rakers 9+13, lanceolate, slightly clavate, length 1 1/2 in eye, subequal with gill filaments.

Scales 35 or 36 in lateral line, little enlarged; 4 above, 5 below, 12 predorsal to occiput. Ventral with pointed axillary scale 1/4 fin length.

Caudal base scaly. Scales all very caducous, mostly fallen.

Antorbital luminous organ large, with small supraorbital section at upper front eye edge about 1/3 diameter of pupil and above nostril, lower section broadly triangular, with greatest extent along lower front eye edge; 2 opercular photophores, upper larger and in line with lower eye edge and pectoral fin origin, lower close behind maxillary hind end and often veiled; 3 equidistant veiled branchiostegals, often obscured by extensive luminous masses; 5 pectorals, first interspace largest, nearly or

quite equals space between second and fifth photophores, fourth above and little behind third or at same level as upper subpectoral; 1 suprapectoral, at lowest third to fifth between lateral line and pectoral fin origin, over pectoral fin origin and little advanced from upper subpectoral; 2 subpectorals, first or lower median in line with first pectoral and upper subpectoral, which close below pectoral fin base; 5 ventrals, second and third progressively elevated from first to third elevated level with fourth pectoral though little advanced from fourth ventral; 1 supraventral,

at lowest 1/3 to 2/5 between lateral line and ventral fin base; 6+5 analz, anteroanalz arched toward anal fin base so first well elevated though anterior to second, also hind anteroanalz curve up contiguously to posterolateral, posteroanalz usually behind anal fin base though sometimes first spot may fall over base of last anal ray; 3 supraanalz, in inclined line, with first or lowest beginning little behind fifth ventral to which nearer than to median. supraanal which falls well below lateral line; 1 posterolateral, similar to uppermost supraanal, below lateral

line though opposite adipose fin origin; 4 precaudals, arched along lower lobe of caudal with fourth about midway in space below end of lateral line as caudal retracted. Luminous organ below suprapectoral.

D. $\underline{\underline{\text{IV}}}$, 10, $\underline{\underline{\text{I}}}$ to $\underline{\underline{\text{IV}}}$; 12, $\underline{\underline{\text{I}}}$, first branched ray 1 2/5 to 1 1/2 in head; adipose fin 4 2/3 to 4 4/5; A. $\underline{\underline{\text{III}}}$, 11, $\underline{\underline{\text{I}}}$ or $\underline{\underline{\text{IV}}}$, 12, $\underline{\underline{\text{I}}}$, first branched ray 2 1/8 to 2 1/2; caudal 1 1/3 to 1 2/7, forked; least depth of caudal peduncle 3 to 3 1/3; pectoral 2 1/2 to 2 3/5; ventral 1 1/2 to 1 3/4.

Brown, scale pockets darker. Scales and sides of head shining

silvery white, with iridescent tints. Iris whitish. Inside gill opening blackish. Fins all pale brownish to whitish, bases dusky.

Indian and Pacific Oceans. My materials seem to agree in most every way with Brauer's figure.

2487. D. 5317. China Sea vicinity of Formosa (N. 21° 36' E. 117° 27'). In 230 fathoms. November 5, 1908. Length 115 mm.

3647. D. 5564. Dammi Island (N.), S. 85° W., 6.1 miles (N. 5° 50' E. 120° 31'), between Jolo and Tawi Tawi. In 236 fathoms. September 21, 1909. Length 148 mm.

4335. D. 5567. Dammi Island (N.), N. 81° W., 9 miles (N. 5° 48' E. 120° 33' 45"), north of Tawi Tawi. In 268 fathoms. September 21, 1909. Length 158 mm.

4419. D. 5331. Hermana Menor Island (E.), N. 13° E., 7.30 miles (N. 15° 36' 45" E. 119° 47' 45"), off Western Luzon. In 178 fathoms. November 22, 1908. Length 153 mm.

4322

1568. D. 5135. Jolo Light, S. 46° W., 11.90 miles (N. 6° 11' 50" E. 121° 8' 20"), vicinity of Jolo. In 161 fathoms. February 7, 1908. Length 155 mm.

2410.
2407, 1 D. 5589. Mabul Island (N.W.) N. 3° W., 2.8 miles (N. 4° 12' 10" E. 118° 38' 8"), Sibuko Bay, Borneo and vicinity. In 260 fathoms. September 29, 1909. Length 118 to 143 1/2 mm.

3852.
3826, 1 D. 5621. Makyan Island (S.), N. 54° W., 3 miles (N. 0° 15' E. 127° 24' 35"), between Gillolo and Makyan Islands. In 298 fathoms. November 28, 1909. Length 145? to 147 1/2 mm.

1625, 1626. D. 5266. Matocot Point, S. 22° E., 7 miles (N. 13° 44' 36" E. 120° 59' 15"), Verde Island Passage and Batangas Bay. In 100 to 135 mm. June 8, 1908. Length 130 to 158 mm.

2756. D. 5268. Matocot Point, S. 50° E., 5.80 miles (N. 13° 42' E. 120° 57' 15"). In 170 fathoms. June 8, 1908. Length 168 mm.

2180, 2993. D. 5374. Tayabas Light (outer), N. 9° E., 7.4 miles (N. 13° 46' 45" E. 121° 35' 8"), Marinduque Island and vicinity. In 190 fathoms. March 2, 1909. Length 123 to 153 mm.

4324

Diaphus watasei Jordan and Starks

Diaphus watasei Jordan and Starks, Bull. U. S. Fish Comm., vol. 22, 1902 (1904), p. 580, fig. Off Atami, in Sagami Bay, in 153 fathoms; off Misaki. — Parr, Proc. U. S. Nat. Mus., vol. 76, 1929, p. 39, fig. 19 (type).

Diaphus coeruleus (not Klunzinger) Parr, Bull. Bingham Oceanogr. Coll., vol. 3, art. 3, dec. 1928, p. 122 (part).

Depth 4 7/8; head 3 2/3, width 2 1/2. Snout 7 in head; eye 3 7/8, greater than snout or interorbital; maxillary reaches well beyond eye though not quite to well inclined hind preopercle edge, slender, length 1 1/3 in head; interorbital 4 1/5, nearly level. Gill rakers 7 + 14, lanceolate, 1 1/2 in eye; gill filaments 3/4 gill rakers.

Scales 36 in lateral line to caudal base and 2 more on latter, apparently none enlarged, tubes simple, conspicuous. Scales very caducous, most all now fallen. Caudal base apparently scaly.

Diaphus watasei Jordan and Starks

Diaphus watasei Jordan and Starks,
Bull. U. S. Fish Comm., vol. 22, 1902
(1904), p. 580, fig. Off Atami in
Sagami Bay, in 153 fathoms; off
Misaki. — Parr, Proc. U. S. Nat. Mus., vol.
76, 1929, p. 39, fig. 19 (type).

Diaphus coeruleus (not Klunzinger) Parr,
Bull. Bingham Oceanogr. Coll., vol. 3, art.
3, Dec. 1928, p. 122 (part).

4326

Large antorbital luminous organ, upper lobe moderate above nostril, lower lobe much larger and extends along lower front half of eye; 2 opercular, upper much larger and falls on line with lower eye edge and upper subpectoral, lower very small, veiled, behind end of maxillary; 3? veiled branchiostegals; 5 pectorals, first interspace greatest, fourth photophore little above level with upper? subpectoral over and behind third ventral; 1 suprapectoral at lower third between lateral line and pectoral fin origin; 2 subpectorals, first or lower in line with first pectoral and upper subpectoral

though nearer latter; upper subpectoral close before bases of lowest pectoral fin rays and little before supraventral; 5 ventrals, progressively higher from first to third, latter about level with fourth pectoral and interspace between it and fourth ventral shortest of ventral series; 1 supraventral, little nearer ventral fin base than lateral line; 7+5 anals, first much higher than second anteroanal though little lower than median supraanal and last 2 anteroanals rise progressively to form line with mediolateral, all equidistant, posteroanals behind ventral fin base; 3 supraanals in inclined

line from first or lowest little behind and above last ventral to uppermost - or third, lower interspace of series little less than upper and uppermost photophores well below lateral line; 1 posteriolateral little lower than level of uppermost supraanal; arc of 4 precaudals rising from first or lowest, uppermost little more separated than others about upper third in space below lateral line. Small luminous organ below suprapectoral photophore, but little larger.

D. III, 11, I, first branched ray 1½? in head; adipose fin 3 7/8; A. III, 12, I, first branched ray 2?;

caudal (damaged) apparently emarginate; least depth of caudal peduncle 3 1/10; pectoral 3 1/2; ventral 2.

Skin brown. Scale pockets of lateral line all accentuated with dark brown dots. Portions of skin show numerous dusky to blackish dots. Iris silvery white. Luminous antorbital organs buff. Fins pale brownish, apparently whitish.

Japan. Parr's sketch of the type shows the infraorbital space too deep, snout too long, the slender adipose fin should begin clearly behind last anal ray base, and space behind last posteroanal and first precaudal photophores too short.

4330

51443 U.S.N.M.

Albatross Collection (3698). In 153 fathoms: Length 120 mm.; caudal tipt damaged. Type:

Diaphus parri new species

depth 5 to 5 1/4; head 3 1/2 to 3 3/5, width 2 1/4 to 2 1/2. Snout 6 1/2 to 7 in head; eye 4 1/4 to 4 1/3, greater than snout, 1 in interorbital anteriorly; maxillary extends over eye diameter behind eye though not quite to well inclined hind preopercle edge, slender, length 1 1/3 to 1 2/5 in head; interorbital 4 1/8 to 4 1/3, broadly convex. Gill rakers 5+14, lanceolate, 1 1/4 in eye; gill filaments 2/3 gill rakers.

Scales 35 in lateral line to caudal base, scarcely enlarged, tubes simple, prominent; 3 above, 3 below.

4332

Large pointed scale in axil of ventral fin 2 1/3 in fin. Scales very caducous, most all fallen. Caudal base scaly.

Large antorbital luminous organ along most of front eye edge; 1 photophore opercular, slightly below line from lower eye edge to suprapectoral; 3 veiled branchiostegals equidistant; 5 pectorals, first interspace longest, fourth slightly behind and elevated little above upper subpectoral or about level with third ventral; 1 supraventral little below middle between lateral line and pectoral origin; 2 subpectorals,

first midway in inclined series from first pectoral to upper subpectoral, which little before suprapectoral or close before lower pectoral fin ray bases; 5 ventrals, third elevated till slightly higher than first or lowest supraanal and close before fourth ventral; 1 supraventral, midway between lateral line and ventral fin origin; 4 + 6 anals, first anteroanal slightly higher than second, first posteroanal over base of last anal ray; 3 supraanals in inclined line, first or lowest above and posterior from fifth ventral, second little nearer

first than third or uppermost which close below lateral line over anal fin origin; 2 posterolaterals, first forms continuous arc with last anteroanal and second or upper, which little lower below lateral line than upper supraanal; 4 precaudals arched progressively along base of lower caudal lobe with fourth or last level with upper posterolateral. Moderate luminous organ below suprapectoral photophore.

D. III, 12, I, first branched ray 1 2/5 to 1 1/2 in head; adipose fin length 4 2/5 to 4 4/5; A. III, 13, I, first branched ray

1 7/8 to 2; caudal 1 1/4, well forked, least depth of caudal peduncle 2 3/4 to 3; pectoral 3 to 3 1/5; ventral 1 2/5 to 1 2/3.

Skin brown, scales pale or with silvery and iridescent reflections. Skin most everywhere sprinkled with minute dusky dots, some dots variably larger than others. Sides of head silvery white, also iris. Fins all whitish.

Diagnosis. Related to Diaphus coeruleum Klunzinger but differs chiefly in the lower position of the suprapectoral photophore, the more

elevated supraventral, higher first anteroanal, and line joining first and second anteroanals forming sharper angle with even curve in which all remaining anteroanals are arranged. No separation of the antorbitals as in *Diaphus coeruleum*.

Type No. U.S.N.M.

4337

D. 5268. Inatocot Point, S. 50° E. 5.80 miles (N. Lat. 13°42' E. Long. 120° 5-7' 15"), Verde Island Passage and Batangas Bay. In 170 fathoms. June 8, 1908. Length 100 to 128? mm. 3 examples. Type (largest) and paratypes.

D. 5393. Panganalan Point, Talajit Island, S. 59° E., 14.8 miles (N. Lat. 12° 3' 30" E. Long. 124° 3' 36"), between Samar and Masbate. In 136 fathoms. March 13, 1909. Length 69 mm. In poor condition.

D. 5391. (Destacado Island) Tubig Point, N. 31° E., 3 miles (N. Lat. 12° 13' 15" E. Long. 124° 05' 03"), between Samar and Masbate. In 118 fathoms. March 13, 1909.

Diaphus regani Tåning.

Diaphus regani Tåning, Vidensk. Medd. dansk naturh. Foren. København, vol. 94, ~~1937~~ p. 139, fig. 12, 1932 (type locality; off New Caledonia, S. 20°53.2' Lat., E. 164°03.3' Long.).

4338

Diaphus pacificus Parr

Diaphus pacificus Parr, Bull. Bingham Oceanogr. Collection, vol. 2, art. 4, Oct. 1931, p. 34, fig. 14. N. 16°14' W. 99°36'30", 625 fathoms.

Depth 3 2/3; head 3 1/8, width 2 1/5. Snout 5 1/2 in head; eye 4, greater than snout; maxillary extends eye diameter behind eye, slender, length 1 2/5 in head; interorbital moderately high.

Scales 32 in lateral line.

Two antorbital luminous bodies, upper extends mesad to or somewhat beyond vertical from center of nasal organ, lower curves gently forward

below nostril; 5 pectoral photophores, first interval greatly exceeds others, fourth spot elevated level with upper subpectoral over interval between third and fifth pectorals; 1 supraventral, little nearer pectoral fin origin than lateral line; 2 subpectorals, in inclined line with first pectoral, first little nearer first pectoral and second subpectoral close before lower pectoral ray bases, or close before suprapectoral; 5 ventrals, third elevated level with

4340

supraventral forming rather acute isosceles triangle with second and fourth ventrals, first to third ventrals in somewhat curved series; 1 supraventral, near lower third between lateral line and ventral fin base. anals 4 + 4, first anteroanal elevated though not quite high as median supraanal, posteroanals behind anal fin base; 3 supranals, in inclined line passing behind last ventral, first slightly higher than last ventral, second little nearer first than third which about upper third between lateral line and anal fin

origin; 1 posterolateral, level with upper supraanal; 4 precaudals, in evenly curved series, fourth little posterior to third and equally far from end of lateral line. Suprapectoral with large luminous scale below.

D. 14, I, 9; A. 12, I, 8, origin in vertical from basal end of dorsal; least depth of caudal peduncle 2 1/5 in head; pectoral 3; ventral origin below dorsal origin.

Length without caudal 28 mm. (Parr.)

Off western Mexico.

4342

Diaphus tagamiensis Gilbert

Diaphus tagamiensis Gilbert, Mem. Carnegie Mus., vol. 6, No. 2, Aug. 1913, p. 96, pl. 13, fig. 2. Tagami Bay. — Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, Sep. 1914, p. 213 (Tagami Bay). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 122 (compiled).

Depth 4; head 3, width 2 3/4. Snout 5 1/2 in head from snout tip; eye 3 1/8, greater than snout or subequal with interorbital; maxillary reaches back nearly eye diameter beyond eye, slender, length 1 2/5 in head from

snout tip; interorbital 3 1/8, convex, rather high.

Scales very caducous, most all fallen, apparently not enlarged in lateral line.

Antorbital luminous organ narrow along lower front eye edge; upper section not defined; 1 opercular photophore on level with lower eye edge and upper subpectoral, lower photophore not evident; 3 veiled equidistant branchiostegals; 5 pectorals, first interspace greatest and fourth photophore over and little behind third, about level with upper subpectoral; 1

suprapectoral slightly below
middle in space between
lateral line and pectoral fin
origin; 2 subpectorals, first
or lower in line from first
pectoral to upper subpectoral,
which close before bases of
lowest pectoral fin rays; 5
ventrals, progressively higher
from first to third, which
nearly level with fourth pectoral;
1 supraventral, midway between
lateral line and pectoral fin
base; 6 + 5 anals, first and
sixth anteroanals little elevated,
posteroanals all behind anal
fin base; 3 supraanals in
slightly inclined line from

first or lowest which little behind fifth ventral up to third, which close below lateral line opposite anal fin origin and second little nearer first though little higher than first anteroanal; 1 posterolateral above and behind last anteroanal close below lateral line; 4 precaudals in arc on caudal base with last slightly more separated from third and rather close below and behind end of lateral line.

total
D. III, 13, height about 1 1/4 in ^ head; adipose fin length 3 1/2; A. III, 12, fin height 2 1/4; caudal (damaged) evidently forked;

least depth of caudal peduncle 3 2/3; pectoral 3; ventral 2 1/5.

Skin dark brown, with dusky about scale pockets. Snout and jaws whitish. Iris silvery gray. Fins pale to whitish, caudal base dusky.

Japan. Gilbert's description was based on an example 67 mm. long in the Carnegie museum. It is figured with the suprapectoral photophore near upper 2/5 in space between pectoral fin origin and lateral line, though the description says "... its distance from lateral line but half its distance from pectoral base." In most every other respect the arrangement of the photophores is greatly like

those of his figure of Diaphus anteorbitalis, only the interspaces between the median and uppermost supraanal and the last anteroanal and mediolateral slightly greater in Diaphus saganiensis. The chief differences would seem to be the greater development of the antorbital luminous organs of Diaphus anteorbitalis, while in Diaphus saganiensis they seem to be less extensive their general appearance is similar.

Other items supplied by Gilbert's figure and description are due to its larger size and evidently better preservation. Thus

4348

the ventral axillary scale is shown nearly 1/3 ventral fin length and caudal fin base scaly.

74648 U.S.N.M.

Albatross Collection (5064). Length 16 mm.

4349

Diaphus tanabal Gilbert

Diaphus tanabal Gilbert, Mem. Carnegie Mus., vol. 6, no. 2, Aug. 1913, p. 88. Off south coast Kiusiu in N. Lat. 31°10'30" E. Long. 131°58'30", in 300 fathoms. — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 122 (note); Proc. U. S. Nat. Mus., vol. 76, art. 10, 1929, p. 44, fig. 21 (type).

Depth 3 1/2; head 2 2/3, width 2 3/4. Snout 6 in head; eye 3 1/2, greater than snout, about equals interorbital; maxillary extends well beyond eye though not to well inclined hind preopercle edge, slender, length 1 1/2 in head, interorbital 3 1/4, convex.

4350

Scales 36 in lateral line, not enlarged, tubes large, distinct; 3 above. Scales all very caducous, most all fallen. Caudal base evidently scaly.

Antorbital luminous organs small, upper section close over and subequal with nostrils, lower section as narrow crescent only along front eye edge, enveloped in black pigment forming narrow border; 2 opercular photophores, upper larger and slightly above line from lower eye edge and upper subpectoral, lower behind hind maxillary end; 3 veiled equidistant branchiostegals; 5 pectorals, first interspace greatest, fourth photophore over and little posterior from third

and at same level as upper subpectoral;
1 suprapectoral, about upper third
in space between lateral line and
pectoral fin origin, also little in
advance of upper subpectoral; 2
subpectorals, first or lower median
in inclined line from first pectoral
to upper subpectoral, which close
before bases of lowest pectoral fin
rays; 5 ventrals, progressively higher
from first to third, which nearly
level with fourth ventral; 1 suprabentral
about lower 2/5 between lateral
line and ventral fin origin; 6+5
anals, first anteroanal little
elevated, last less so, posteroanals
all behind anal fin base; 3
supraanals in slightly inclined
line from vertical, first or lowest

and median closer and third on lateral line; 1 posteriolateral on lateral line over last anteroanal; 4 precaudals in arc along base of lower caudal lobe, progressively higher with last little more separated and close below end of lateral line.

D. II, 13, first branched ray about 1 1/3 in head; adipose fin length 3; A. II, 13, first branched ray 2 1/2; caudal (damaged) evidently subequal with head; least depth of caudal peduncle 2 4/5; pectoral 2 1/3; ventral 2 1/8, inserted behind dorsal origin.

Skin dusky, nearly blackish brown. Muzzle and jaws pale to whitish. Fins whitish, caudal

base blackish brown.

Japan. Only known from the specimens here listed, the above description from the type.

74470 U.S.N.M.

Albatross Collection (4951). Length 20 mm. Type.

74652 U.S.N.M.

Albatross Collection (4951). 2 examples. Length 14 mm. Paratypes.

4357

Diaphus problematicus Parr

Diaphus problematicus Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 143, fig. 32. N. 24° W. 77°17', 6000 feet, Bahamas; N. 24°29' W. 77°29', 8000 feet.

Depth 4 1/4; head 3 2/5. Snout 6 in head; eye 5, greater than snout; maxillary extends 1 3/4 eye diameters behind eye, length 1 2/5 in head; interorbital high.

Scales 37 or 38 in lateral line, scales not conspicuously enlarged on tail.

Two distinct, rounded and well separated antorbitals on each side, one above and 1 below nostril connected by usual strand of black tissue; 2 operculars upper in slightly inclined

line from lower eye edge to upper subpectoral; 5 pectorals, first interspace longest, fourth spot over interval between third and fifth pectorals and elevated level with upper subpectoral; 1 suprapectoral near lowest third in space between lateral line and pectoral fin origin; 2 subpectorals, first little nearer first pectoral with which in line and upper spot close before bases of lowest pectoral rays; 5 ventrals, second and third elevated in little inclined with first; 1 supraventral, midway between lateral line and ventral fin base; anals 6 + 5 or 6, first and last anteroanals little elevated, posteroanals behind anal fin base; 3 supraanals, median nearer lowest, third diameter below lateral line; 1 posterolateral 1 diameter below lateral line; 4 precaudals, equidistant in curve with fourth 1 diameter below end of lateral line. A suprapectoral with luminous scale.

t.[2] depth 3 9/10 7/8 to 4; head 3 2/5 to 3 1/2; supraventral nearer lateral line than ventral fin base; eye 3 1/4, to 3 4/5. senoi.

l.[4]

4356

D. 17; A. 18 or 19; pectoral 2 1/2 in head.

Uniform deep black on head, trunk and tail. Length 30 mm. without caudal. (Parr.)

Bahamas.

Stetson.

narrow supraorbital extension o

4357

Diaphus splendidus (Brauer)

Myctophum (Myctophus) splendidum

Brauer, Zool. Anzeiger, vol. 28, nr. 10, Dec. 20, 1904, p. (392)399, fig. 7. Atlantic and Indian Oceans.

Myctophum (Diaphus) splendidum

Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 218, text figs. 138-139 (S. 3°55'E. 7°48'5"; Gulf of Guinea; S. 9°31'E. 9°46'; S. 10°8'2"E. 97°14'2" between Cocos and Sumatra; S. 0°58'2"E. 99°43'2"; N. 0°16'5"E. 98°7'5"; N. 5°23'2"E. 94°48'1"; N. 7°1'2"E. 85°56'5", Bay of Bengal; S. 3°26'2" E. 58°34'2", Seychelles; S. 0°27'4"E. 42°47'3", off north east Africa; N. 9°6'1"E. 53°41'2", Mauritius).

Diaphus splendidus Weber, Siboga Exped., — Jaaning, Videnskb. Medd. Dansk Naturh. Foren. Kjöbenhavn, vol. 86, 1928, p. 60 (diagnosis in key).

Oceanogr. Collection, vol. 3, art. 3, Dec. 1928,

4357

Diaphus splendidus (Brauer)

Myctophum (Myctophus) splendidum

Brauer, Zool. Anzeiger, vol. 28, (1) Dr. 10, Dec. 20, 1904, p. (392) 399, fig. 7. Atlantic and Indian Oceans.

Myctophum (Diaphus) splendidum

Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 218, text figs. 138-139 (S. 3°55'E. 7°48'5"; Gulf of Guinea; S. 9°31'E. 9°46'; S. 10°8'2"E. 97°14'2" between Cocos and Sumatra; S. 0°58'2"E. 99°43'2"; N. 0°16'5"E. 98°7'5"; N. 5°23'2"E. 94°48'1"; N. 7°1'2"E. 85°56'5", Bay of Bengal; S. 3°26'2" E. 58°34'2", Seychelles; S. 0°27'4"E. 42°47'3", off North east Africa; N. 9°6'1"E. 53°41'2"; Mauritius).

Diaphus splendidus Weber, Siboga Exped., vol. 57, Fische, 1913, p. 90 (Madura Sea, in 289 meters). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928,

4358

p. 123 (compiled).

Myctophum splendidum Weber and Beaufort, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 170 (Weber & material).

Depth 4 to 5; head 3 2/5 to 3 1/2, width 2 1/4 to 2 3/4. Snout 5 1/2 to 6 in head from snout tip; eye 3 3/4 to 4, greater than snout, 1 to 1 1/8 in interorbital; maxillary reaches well beyond eye though not quite to inclined hind preopercle edge, length 1 1/3 to 1 1/2 in head from snout tip; interorbital 3 3/5 to 4, convex. Gill rakers 8 + 15, lanceolate, 1 2/5 in eye, twice gill filaments.

4359

Scales 37 in lateral line to caudal base and 2 more on latter, not especially enlarged, tubes simple and prominent; 3? above, 4? below, 15 predorsal forward to eye. Caudal base scaly. Ventral with large pointed axillary scale, nearly 1/2 fin length. Scales with 6 basal radiating striae and 8 weak apically; circuli rather fine and complete.

Antorbital luminous organs 2 in black enveloping pigment, upper on upper front eye edge, lower well anterior on lower front edge, sometimes larger; 2 opercular photophores, upper on line with lower eye edge and upper subpectoral, lower smaller;

3 equidistant branchiostegals; 5
pectorals, first interspace greatest,
fourth photophore above and little
behind third or on level with
upper subpectoral; 1 suprapectoral
midway in space between lateral
line and pectoral fin origin; 2 in large luminous organ
subpectorals, lower or first before
suprapectoral and midway in
inclined line from first pectoral
to upper subpectoral, which close
before bases of lowest pectoral rays;
5 ventrals, second or second and
third progressively elevated from
first, when third then level with
first or lowest supraanal; 1
supraventral near upper third to
midway between lateral line and
ventral fin base; 5 to 7 + 4 to 6
anals, first anteroanal above

second and posteroanals all behind anal base; 3 supraanals in inclined or slightly curved row from last ventral, first and second closer though second level or above plane with first supraanal and third on lateral line close before anal fin origin; 2 posterolaterals, first or lower little above and close behind last anteroanal, upper on lateral line opposite adipose fin origin; 4 precaudals, last elevated close below end of lateral line.

D. III, 10, I or III, 11, I, first branched ray 1 1/4 to 1 2/3 in total head length; adipose fin 2 7/8 to 3 1/5; A. III, 11, I or III, 12, I, first branched ray 1 3/5 to 2; caudal 1 1/5 to subequal with

head, well forked; least depth of caudal peduncle 2 1/3 to 3; pectoral 2 1/10 to 2 4/5; ventral 1 1/2 to 1 3/4.

Brown, dusky on skin where scales have fallen and especially so at caudal base. Scales and head largely with silvery white, also iridescent. Iris pale to silvery white. Fins pale or brownish white to white.

4363

D. 5530. Balicasag Island (C.), N. 32° E., 4.3 miles (N. 9° 26' 45" E. 123° 38' 30"), between Siquijor and Bohol Islands. August 11, 1909. Length 17 mm.

D. 5604. Bilatu (town), N. 26° W., 8.7 miles (N. 0° 22' 30" E. 122° 42' 30") Gulf of Tomini, Celebes. November 15, 1909. 4 examples. Length 17 to 20 mm.

D. 5177. Escarceo Light, S. 53° E., 5.8 miles (N. 13° 35', E. 120° 54' 36"), Verde Island Passage. 260 fathoms. March 24, 1908. 4 examples. Length 19 to 26 mm.

D. 5319. ~~Ibugos Island~~ N. 21° 23' E. 117° 53', China Sea, vicinity of Formosa. November 5, 1908. 2 examples. Length 19 to 52 mm.

D. 5234. Limasawa Island (S.), S. 70° 30' E., 18.50 miles (N. 10° E. 124° 46' 06" E.), between Bohol and Leyte. May 7, 1908. 2 examples. Length 20 to 30 mm.

4364

D. 5185. Lusaran Light, N. 23° E., 25.50 miles (N. 10° 05' 45" E. 122° 18' 30"), between Panay and Negros. 638 fathoms. March 30, 1908. 3 examples. Length 16 to 44 mm.

D. 5500. Macabalan Point Light, S. 20° E., 7.9 miles (N. 8° 37' 45" E. 124° 36' 45"), Mindanao. 267 fathoms. August 4, 1909. Length 20 mm.

D. 5238. Point Lambajon, S. 65° W., 4.30 ~~5.00~~ miles (N. 7° 34' 45" E. 126° 38' 15"), Pacific Ocean, east coast of Mindanao. 380 fathoms. May 12, 1908. Length 33 mm.

D. 5227. Point Origon, S. 44° E., 18.30 miles (N. 12° 53' 45" E. 121° 52' 30"), east of Mindoro. 322 fathoms. May 5, 1908. 5 examples. Length 20 to 21 mm.

D. 5633. Selang Point, N. 24° W., 11.8 miles (S. 1° 03' 00" E. 127° 44' 00"), south of Patiente Strait. December 2, 1909. Length 17 mm.

D. 5583. Si Amil Island (N.) N. 88° W., 3.2 miles (N. 4° 19' 00" E. 118° 56' 20"), Sibuko Bay, Borneo, and vicinity; 447 fathoms. September 27, 1909. Length 89 mm. In poor preservation.

2747

4366

Diaphus signatus Gilbert

Diaphus signatus Gilbert, Mem. Mus. Comp. Zool., vol. 26, no. 6, 1908, p. 228, pl. 3. Near Nukuhiva, Marquesas Islands. — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 123 (reference). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 68 (compiled). — Parr, Proc. U.S. Nat. Mus., vol. 76, art. 10, 1929, p. 45 (type).

Depth 5 to 5 2/5; head 3 1/3 to 3 3/4, width 2 2/5 to 2 3/5. Snout 7 2/5 to 7 3/4 in head from snout tip; eye 3 4/5 to 4, greater than snout, subequal with interorbital; maxillary reaches far

behind eye, not expanded, apparently reaches oblique hind preopercle edge, length 1 1/3 to 1 2/5 in head; interorbital 3 to 3 1/4, little convex. Gill rakers 6+13, slender, 3/4 of eye.

Scales 38 in lateral line, small; 3 above, 3 below. Scales very deciduous, most all fallen.

Antorbital luminous organ slightly greater than vertical pupil diameter along front eye edge; 2 opercular photophores, upper larger; 3 veiled branchiostegals equidistant; 5 pectorals, first and second more distant than second and third and third and fifth nearest,

fourth pectoral over third and slightly higher than upper subpectoral; 1 suprapectoral, above hind angle of gill cover, little nearer lateral line than pectoral origin and slightly before upper subpectoral, which close before bases of lowest pectoral rays; front or lower subpectoral lower than upper, though little closer to same than to first pectoral, also well before suprapectoral; 5 ventrals, second and third progressively elevated, second close behind first and third close before and closer to fourth; 1 supraventral, little nearer lateral

line than ventral base; 6 + 5 anals, first anteroanal elevated over second, which well separated from third, which progressively inclined to sixth which well elevated from first posteroanal; 3 supraanals, first little above and behind last ventral, second still higher or little above level of first anteroanal and third close below lateral line and slightly posterior to second; 1 posterodateral, close below lateral line and little behind last anteroanal; 4 precaudals, first 3 nearly equidistant and in slightly inclined line, fourth close below

lateral line, at median caudal base.

D. III, 11, I, first branched ray 1 1/5 to 1 1/3 in head; adipose fin 3 1/8 to 4; A. III, 12, I, first branched ray 1 3/4 to 2?; caudal damaged, well forked; least depth of caudal peduncle 2 7/8 to 3; pectoral 2 to 2 1/3; ventral 1 1/8 to 1 2/5.

Blackish, vertical fin bases black. Vertical fins with articulations of fin rays blackish, fins otherwise whitish.

Southern and western Pacific.

Although Gilbert gives "Postero-anals four in number (five in *splendidus*)"?

> D. 5387. Bagatao Island Light (outer), S. 80° E., 27 miles (12° 54' 40" N., 123° 20' 30" E.), between Burias and Luzon, in 209 fathoms. March 11, 1909. Length 54 to 78 mm. 50 examples. One with large knean protruding from front of back.

> 1524. D. 5575. Mt. Dromedari (Tawi Tawi), S. 16° W., 19.2 miles (5° 28' 30" N., 120° 2' 27" E.), north of Tawi Tawi, in 315 fathoms. September 23, 1909. Length 52 mm.

> 3828. D. 5621. Makyan Island (S.), N. 54° W., 3 miles (0° 15' 00" N., 127° 24' 35" E.), between Gilolo and Makyan, in 298 fathoms. November 28, 1909. Length 67 mm.

his figure shows 5. The type now has but 3 anterior each side intact though there are also impressions for 2 more each side. In this species the preorbital is nearly hour-glass shape, though not clearly divided and appears as if single. Ventral inserted before dorsal origin. Caudal photophores not clearly set off from posteroanals.

D. 5267. Matocot Point, S. 39° E., 5.5 miles (13° 42' 20" N., 120° 58' 25" E.), Verde Island Passage and Batangas Bay, in 170 fathoms. June 8, 1908. Length 51 to 74 mm. 5 examples.

> D. 5365. Cape Santiago Light, N. 73° W., 6.7 miles (13° 44' 24" N., 120° 45' 30" E.), Balayan Bay, Luzon, in 214 fathoms. February 22, 1909. Length 80 mm.

D. 5497. Bantigui Island, N. 64° W., 10 miles (N. 9°7'15" E. 124°39'30"), between Leyte and Mindanao. In 960 fathoms. August 3, 1909. Length 13 to 44 mm. 11 examples.

D. 5486. Botobolo Point (Panaon Island), S. 19° W., 6 miles (N. 10°2' E. 125°19'20"), between Leyte and Mindanao. In 585 fathoms. July 31, 1909. Length 16 mm.

D. 5185. Lusaran Light, N. 23° E., 25.50 miles (N. 10°5'45" E. 122°18'30"), between Panay and Negros. In 683 fathoms. March 30, 1908. Length 47 mm.

D. 5185. Lusaran Light, N. 230 E., 25.50 miles (10° 5' 45" N., 122° 18' 30" E.), between Panay and Negros, in 638 fathoms. March 30, 1908. Length 40 mm. In poor condition.

D. 5567. Dammi Island (N.), N. 81° W., 9 miles (5° 48' 00" N., 120° 33' 45" E.), north of Tawi Tawi, in 268 fathoms. September 21, 1909. Length 53 mm.

D. 5493. Diuata Point (N.), N. 84° W., 5.5 miles (9° 4' N., 125° 20' E.), between Leyte and Mindanao, in 478 fathoms. August 2, 1909. Length 42 mm.

4373

D. 5125. Togat Island (W.), S. 11° E., 24 miles (N. 10°48' E. 121°48'30"), Sulu Sea, vicinity southern Panay. In 411 fathoms. February 3, 1908. Length 44 mm.

D. 5227. Point Arigan, S. 44° E., 18.30 miles (N. 12°53'45" E. 121°52'30"), east of Mindoro. In 322 fathoms. May 5, 1908. Length 40 mm.

1 example. Varadero Bay. July 23, 1908 (12.30 A.M. to 1.45 P.M.). Length 42 mm.

75767 U.S.N.M.

Nukuhiva, Marquesas Islands, Albatross Collection (27). Length 58 mm. Type of Diaphus signatus.

D. 5763. Point Origon, N. 85° E.,
28.3 miles (12° 38' 30" N., 121° 37' 30" E.),
off Eastern Mindoro, June 4, 1908.
Length 17 to 52 mm. 3 examples.

D. 5572. Ximalue Island (N.), S. 51°
E., 4.7 miles (5° 31' 26" N., 120° 9' 45" E.),
north of Tawi Tawi, in 334 fathoms.
September 22, 1909. Length 53 to 62 mm.
3 examples.

D. 5633. Velang Point, N. 24° W., 11.8
miles (1° 3' 00" S., 127° 44' 00" E.), south
of Patiente Strait. December 2, 1909.
Length 45 mm.

75804 U.S.N.M. N.30° 8' 5" W. 138°.

Albatross Collection (3798). Length

31 mm.

Sta. D. 5227. Point Origon, S. 44° E., 18.30 miles (12° 53' 45" N., 121° 52' 30" E.), east of Mindoro, in 322 fathoms. May 5, 1908. Length 40 mm.

Sta. D. 5486. Botobolo Point (Panaon Island), S. 19° W., 6 miles (10° 02' N., 125° 19' 20" E.), between Leyte and Mindanao, in 585 fathoms. July 31, 1909. Length 16 mm.

Sta. D. 5185. Lusaran Light, N. 23° E., 25.50 miles (10° 5' 45" N., 122° 18' 30" E.), between Panay and Negros, in 638 fathoms. March 30, 1908. Length 47 mm.

4375

D. 5392. Tubig Point, N. 49° E., 5 miles (N. Lat. 12° 12' 35" E. Long. 124° 2' 48"), between Samar and Masbate. 3 on 135 fathoms. March 13, 1909. Length 55 to 111? mm. 36 examples.

2250

= nagasaki Jaaming 4376

Diaphus sensu nec species

Depth 3 9/10 to 4; head 3 2/5 to 3 1/2, width 2. Snout 5 4/5 to 6 1/3 in head; eye 3 1/4 to 3 2/5, greater than snout, equal to subequal with interorbital; maxillary reaches well behind eye or nearly to hind preopercle edge, slender, length 1 2/5 in head; interorbital 2 7/8 to 3, convex. Gill rakers 6+14, lanceolate, 1 1/4 in eye; gill filaments 2/3 of gill rakers.

Scales 36 in lateral line to caudal base, not enlarged; 3 above, 3 below, 10 predorsal to occiput. Ventral with large axillary scale 2 1/2 in fin. Caudal base scaly. Scales

very caducous, most all fallen.

Antorbital luminous organ occupies most of front eye edge; 1 opercular photophore well above hind maxillary end; 5 pectorals, first interspace longest, fourth photophore slightly before and over fifth, level with upper subpectoral; 1 suprapectoral midway between lateral line and pectoral origin or slightly behind upper subpectoral; 2 subpectorals, first or lower little nearer first pectoral than upper subpectoral, which close before bases of lowest pectoral fin rays; 5 ventrals, third elevated level to little

above fourth pectoral and rather close before second ventral; 1 supraventral nearly at upper fourth between lateral line and ventral origin or first ventral photophore; 5 or 6 + 6 anals, first anteroanal little before, over or slightly posterior to second, level to little higher than lower supraanal or lower posterolateral, posteroanals arch upwards toward lateral line little above middle of space below lateral line; 3 supraanals in inclined line with last ventral to uppermost which close below lateral line, first or lowest little nearer last

ventral and second equidistant to upper supraanal; 2 posterolaterals, lower midway to little nearer last anteroanal and upper posterolateral, also posterior, upper less posterior and close below lateral line; 4 precaudals, lower 3 equidistant, closer, in slightly inclined line up and back to uppermost close below and behind end of lateral line. Rather large luminous organ below suprapectoral.

D. III, 12, I, first branched ray 1 1/5 to 1 1/4 in head; adipose fin 3 1/5 to 4 1/3; A. II, 13, I or III, 14, I, first branched ray 1 3/5 to 1 2/3; caudal 1 1/8 to 1 1/4, well

emarginate; least depth of caudal peduncle 2 3/5 to 2 3/4; pectoral 2 to 2 1/8; ventral 1 1/4 to 1 1/3.

Skin brown where scales fallen, variably pale to dark and scale exposures often dusky to blackish. Adherent scales, sides of head and iris with silvery white sheen and iridescent reflections. Fins pale to whitish, often with dusky lines formed of minute dusky dots at articulations.

Diagnosis. Unique in the genus in that the last 2 posteroanal photophores are inclined upward above the general level of the preceding posteroanals.

The antorbital single, large and
at in *Diaphus signatus*.

4382

D. 5493. Diuata Point (N.), N. 84° W., 5.5 miles (N. Lat. 9° 04' E. Lng. 125° 20'), between Leyte and Mindanao. 478 fathoms. August 2, 1909. Length 42 mm.

D. 5422. Lusaran Point Light S. 80° E., 9.7 miles (N. Lat. 10° 31' E. Long. 18° 45"), between Panay and Guimaras. March 30, 1909. Length 13 to 30 mm. examples.

D. 5125. Hogar Island (W.), S. 11° E., 24 miles (N. Lat. 10° 48' E. Lng. 121° 48' 30"), Sulu Sea in vicinity southern Panay. 411 fathoms. February 3, 1908. Length 68 mm. Type.

D. 5227. Point Origan, S. 44° E., 18.30 miles (N. Lat. 12° 53' 45" E. Long. 121° 52' 30"), east of Mindoro. 322 fathoms. May 5, 1908. Length 39 mm.

2283 4383

Diaphus ehrhorni new species

Depth 3 7/8 to 4; head 3 1/2 to 3 3/5, width 2 to 2 1/5. Snout 6 to 7 3/4 in head; eye 3 1/5 to 3 4/5, greater than snout and subequal with interorbital; maxillary reaches well beyond eye but not quite to inclined hind preopercle edge, slender, length 1 2/7 to 1 2/5 in head; interorbital 3 3/4 to 4, well convex. Gill rakers 7 + 13, lanceolate, 1 2/5 in eye; gill filaments 3/4 gill rakers.

Scales 36 or 37 in lateral line to caudal base and 2 or 3 more on latter, but little enlarged, tubes simple, prominent; 3 above, 3 below,

13 or 14 predorsal to occiput. Long pointed scale in ventral axil 2 1/4 in fin. Caudal with small scales basally. Scales with 4 to 7 basal radiating striae and 5 short imperfect apicals marginally; circuli very fine.

Antorbital luminous organ along most of front eye edge, extends above nostril; 2 opercular photophores, small, upper on line with lower eye edge and upper subpectoral, lower veiled; 3 equidistant branchiostegals; 5 pectorals, first interspace longest, fourth photophore above and posterior to third, nearly at same level as upper subpectoral; 1 suprapectoral

4385

midway between lateral line and
pectoral origin, over upper
subpectoral; 2 subpectorals,
first or lower midway between
first pectoral and second or
upper subpectoral, which close
before bases of lowest pectoral
rays; 5 ventrals, first to third
inclined ~~or~~ third, little above level of
fourth pectoral, also second
slightly nearer first and third
but little in advance of fourth,
interspace between fourth and
fifth greatest; 1 5 or 6 + 4 or 5 (1 supraventral, little above middle or opposite 5th space between lateral line and ventral fin base);
anals, first anteroanal well
elevated and little advanced
from second or but little lower
than level of second supraanal,
also last anteroanal little

elevated to form arch contiguous with mediolaterals, posteroanals all well behind anal base; 3 supraanals in inclined line from last ventral, first and second equidistant and uppermost close below lateral line opposite anal origin; 2 posteriolaterals, first or lower well behind and nearly median in place to upper, which close below lateral line; 4 precaudals, lower front 2 at same level, third little higher and fourth little posterior and close below lateral line. Large whitish luminous organ below suprapectoral photophore.

D. III, 11, I, first branched

ray 1 1/8 to 1 1/6 in head; adipose fin 3 1/4 to 3 2/5; A. III, 13, I, first branched ray 1 1/2 to 1 3/5; caudal (damaged) subequal with head, deeply emarginate; least depth of caudal peduncle 2 1/4 to 2 1/2; pectoral 1 7/8 to 2 1/10; ventral 1 1/5 to 1 1/2.

Darks brown generally, especially where scales have fallen, entire sides and lower surfaces dusted with minute dusky dots. Scales burnished with silvery white, iridescent, especially sides of head and iris. Antorbital luminous organ pale yellow with black investing membrane. Fins whitish.

4388

Diagnosis. Close to Diaphus latus Gilbert but apparently differs in the slightly lower supraventral photophore, larger eye, longer head and more posteriorly inserted fins.

This species is also suggestive of Diaphus drachmanni Zaaning from the Indian Ocean, but with little different arrangement of the photophores.

Brauer. Most of the specimens differ in the larger eye and longer head. The dorsals and ventrals also seem to be more posteriorly inserted. The position of the first and second supraanal photophores always holds, especially that of the first so that

4388

Diagnosis. Close to Diaphus latus Gilbert but apparently differs in the slightly lower supraventral photophore, larger eye, longer head and more posteriorly inserted fins.

Type, No. U.S.N.M.

East Indies, Philippines. The material listed below is greatly suggestive of Diaphus coeruleus (Lunzinger) as figured by Brauer. Most of the specimens differ in the larger eye and longer head. The dorsal and ventrals also seem to be more posteriorly inserted. The position of the first and second supraanal photophores always holds, especially that of the first so that

it often really impinges in the course of the lateral line. This is quite at variance with Brauer's figure of Myctophum (Diaphus) coeruleum.

4390

D.5537. Apo Island (C.), S. 46° W., 8.7 miles (N. Lat. 9° 11' 00" E. Long. 123° 23' 00"), between Negros and Siquijor. 254 fathoms. August 19, 1909. Length 80 mm. 24117 to 24119.

D.5389. Bagatao Island Light (outer), N. 3° W., 14 miles (N. Lat. 12° 35' 45" E. Long. 123° 48' 18"), between Ticao Island and Luzon. 80 to 109 fathoms. March 12, 1909. Length 65 to 75 mm.

D.5387, Bagatao Island Light (outer), S. 80° E., 27 miles (N. Lat. 12° 54' 40" E. Long. 123° 20' 30"), between Burias and Luzon. 209 fathoms. March 11, 1909. Length 54 to 78 mm. 50 examples. Type and paratypes. Two with rather large parasitic Isopods protruding from the abdomen.

D. 5365. Cape Santiago Light, N. 73° W., 6.7 miles (N. Lat. 13° 44' 24" E. Long. 120° 45' 30"), Balayan Bay, Luzon. 214 fathoms. February 22, 1909. Length 78 mm.

D. 5567. Dammi Island (N.), N. 81° W., 9 miles (N. Lat. 5° 48' 00" E. Long. 120° 33' 45"), north of Tawi Tawi. 268 fathoms. September 21, 1909. Length 52 mm.

D. 5270. Escarceo Light, S. 9° E., 4.25 miles (N. Lat. 13° 35' 45" E. Long. 120° 58' 30"), Verde Island Passage, Batangas Bay. 235 fathoms. June 8, 1908. Length 27 to 42 mm. 2 examples.

D. 5293. Escarceo Light, N. 59° W., 6 miles (N. Lat. 13° 28' 15" E. Long. 121° 04' 30"), China Sea, vicinity of southern Luzon. 180 fathoms. July 23, 1908. Length 66 to 74 mm. 6 examples.

D. 5552. Jolo Light (E.), N. 60° E., 18.3 miles (N. Lat. 5° 54' 30" E. Long. 120° 44' 15"), Jolo Island. September 17, 1909. Length 50 mm.

3828. D. 5621. Tumkyan Island (S.), N. 54° W., 3 miles (N. Lat. 0° 15' 00" E. Long. 127° 24' 35"). 298 fathoms. November 28, 1909. Length 67 mm.

4393

D. 5281. Malavatuan Island (N.), S. 84° W., 4.30 miles (N. Lat. 13°52' 45" E. Long. 120°25"), China Sea, vicinity southern Luzon. 201 fathoms. July 18, 1908. Length 76 or 77 mm. 2 examples.

D. 5267. Matocot Point, S. 39° E., 5.50 miles (N. Lat. 13°42'20" E. Long. 120°58'25"), Luzon. ~~off Eastern Mindoro~~. 170 fathoms. June 8, 1908. Length 52 to 75 mm. 5 examples.

D. 5297. Matocot Point, S. 50° E., 5.10 miles (N. Lat. 13°41'20" E. Long. 120°58'). 198 fathoms. ~~China Sea, vicinity southern Luzon~~. July 24, 1908. Length 45 to 70 mm. 3 examples.

4394

D. 5298. Inatocot Point, S. 38° E., 6.70 miles (N. Lat. 13° 43' 25" E. Long. 120° 57' 40"), 140 fathoms. July 24, 1908. Length 61 to 75 mm. 9 examples. One with lernean crustacean on throat.

1524. D. 5575. Mount Dromedario (Tawi Tawi), S. 16° W., 19.2 miles (N. Lat. 5° 28' 30" E. Long. 120° 02° 27"), north of Tawi Tawi. 315 fathoms. September 23, 1909. Length 52 mm.

D. 5190. Pescador Island, S. 9° E., 10.70 miles (N. Lat. 10° 08' 15" E. Long. 123° 16' 45"), Tanon Strait, east coast of Negros. 295 fathoms. April 1, 1908. Length 12 to 58 mm. 26 examples.

4395

D.5633. Selang Point, N. 24° W., 11.8 miles (S. Lat. 1° 03' 00" E. Long. 127° 44' 00"), south of Patiente Strait. December 2, 1909. Length 45 mm.

D.5580. Sibutue Island peak, S. 82° E., 23.2 miles (N. Lat. 4° 52' 45" E. Long. 119° 06' 45"), vicinity of Darvel Bay, Borneo. September 25, 1909. 162 fathoms. Length 45 to 70 mm. 3 examples.

D.5572. Simaluc Island (N.), S. 51° E., 4.7 miles (N. Lat. 5° 3' 26" E. Long. 120° 09' 45"), north of Tawi Tawi. 334 fathoms. September 22, 1909. Length 55 to 61 mm. 3 examples.

4396

D. 5662. Tana Kebe Island (W.), N. 17° W., 12.5 miles (S. I. at. 5°43'00" E. Long. 119°18'00"), Flores Sea. 211 fathoms. December 21, 1909. Length 65 to 76 mm. 5 examples.

2259-

4397

Diaphus latus Gilbert

Diaphus latus Gilbert, Mem. Carnegie Mus., vol. 6, No. 2, Aug. 1913, p. 95, pl. 13, fig. 1. Sagami Bay. — Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, Sep. 1914, p. 213 (Sagami Bay). — Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 156 (Misaki). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 123 (compiled).

Depth 4 1/3; head 3 3/4. Snout 6 3/4 in head; eye 4 1/5, greater than snout; maxillary extends 1 1/5 eye diameters behind eye, slender, length 1 2/5 in head; interorbital moderately high. Gillrakers

7+15;
long, slender,

Scales 37 in lateral line, not enlarged.

Upper antorbital photophore small ocellated dot under edge of frontal bone and lower antorbital occupies area between eye and nostril, expanding little above nostril, scarcely extending on ventral edge of orbit; 1 opercular, in inclined line with lower eye edge and upper subpectoral; 3 branchiostegals; 5 pectorals, first interval much greatest, fourth spot over third nearly level with upper

subpectoral; 1 suprapectoral, at upper third in space between lateral line and pectoral fin origin, slightly posterior above upper subpectoral; 2 subpectorals, in inclined line with first pectoral, first equidistant and upper close before bases of lower pectoral rays; 5 ventrals, first to third in inclined line with third little below level of median supraanal, though close before fourth ventral, in vertical; 1 supraventral, about upper third between lateral line and ventral base;

6 to 6 to 6
anals 7 + 5, first anteroanal greatly
elevated or level with median
supraanal, close before second
seventh equally high as first,
anteroanal in vertical, posteroanals
behind anal fin base; 3 supraanals,
very slightly angulated to median
only slightly advanced from vertically
inclined series to fifth ventral,
first little nearer fifth ventral than
median and latter nearer first than
third which close below lateral line;
1 posterolateral; close below lateral
line little behind last anterolateral;

4 precaudals, first and second low, close, third little elevated behind and fourth still posterior little below lateral line.

D. III, 11, I, first branched ray 1 1/10 in head; adipose fin 3; A. II, 13, first branched ray 1 2/3; caudal forked; least depth of caudal peduncle 2 3/5; pectoral 2 1/6; ventral 1 2/5.

Color very dark, mouth and gill cavity black. Vertical fins with rays dotted darker.

Japan. The above description largely from Gilbert's figure.

except fwit greatly elevated until level.

anals 6 + 5, level ^ posteroanals behind

anal fin base; 3 sup

4402

D. 5297. Matocot Point, S. 50° E., 5.10 miles (13° 41' 20" N., 120° 58' E.), China Sea vicinity southern Luzon, in 198 fathoms. July 24, 1908. Length 45 to 70 mm. 3 examples.

226v

4403

Genus Lampadena Goode and Bean

Lampadena Goode and Bean, Oceanic Ichth., 1895, p. 85. Type Lampadena speculigera Goode and Bean, monotypic.

Antorbital luminous organs not conspicuously prominent. First pectoral photophore and 2 subpectorals like first 3 ventrals, not arranged as straight inclined ascending series. Both subpectorals and suprapectoral one above another in same vertical. Supraanals in vertical or vertically inclined row. One posterolateral. Precaudals 3 or 4, distinct from postero-anals and last in lateral line. Photophores divided by black septum. Large luminous

supracaudal and infracaudal plates present. No luminous scales. Dorsal and anal subequal.

Analysis of species

a.' Pectorals all on same level; eye 2 1/2 to 3 1/2.

b.' Anals 0 + 7; 9 pectorals; 6 ventrals; 2 supraanals; eye 3. speculigera.

b.² Anals 7 + 2 or 3; 5 pectorals; 5 or 6 ventrals; 3 supraanals; eye 3. chavesi.

b.³ Anals 2 + 6 to 8; 5 pectorals; 5 pectorals; caudal plates shorter than eyes. brauneri.

b.⁴ Anals 3 or 4 + 1 or 2; 7 pectorals; 3 ventrals; 2 supraanals; eye 3 1/2. anomala.

b.⁵ Anals 2 to 4 + 1 or 2; 5 or 6 pectorals; 3 to 5 ventrals; 1 or 2 supraanals; eye 2 1/2 to 2 4/5. bathyphila.

4405

b.[6], Anals 6 + 4 or 5; 5 pectorals; 8 (or 9?) ventrals; 1 supraanal; eye slightly less than 3. minima.

a.[2] Fourth pectoral photophore elevated; eye 4 1/2 to 5; anals 5 + 2. luminosa.

2264

4406

Lampadena speculigera Goode and Bean

Lampadena speculigera Goode and Bean, Oceanic Ichth., 1895, p. 86, pl. , fig. 99. N. 39° 48'. W. 70° 36', 551 fathoms. — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 561 (compiled). — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee Fische, 1906, — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. 149 (compiled); Proc. U. S. Nat. Mus., vol. 76, 1929, p. 45 (type).

depth 4 1/2 to 4 2/3; head 3 1/5 to 3 3/5, width 1 7/8 to 2 1/2. Snout 7 in head; eye 2 4/5 to 3 1/3, greater than snout, greater than interorbital in young to equal front of interorbital with age; maxillary extends 2/3 an eye diameter behind eye though not quite to slightly inclined hind preopercle edge, length 1 2/5 in head; interorbital 3 1/4 to 3 3/5, depressed. Gill rakers 7+13, slender, lanceolate, 1 3/4 in eye; gill filaments 1/3 of gill rakers.

Scales 40 in lateral line to caudal base, not enlarged; 5 above, 6 below, 12 predorsal forward to occiput. Axillary

ventral scale 3 4/5 in ventral fin. Caudal base finely scaled. Scales with 3 basal radiating striae; circuli very fine, obsolete apically.

Antorbital luminous organ median and rather small at front eye edge; 2 opercular photophores, upper larger and in line with lower eye edge and lower subpectoral, lower behind hind maxillary end; 3 veiled equidistant branchiostegals; 9 pectorals, level; 1 suprapectoral on lateral line over pectoral fin origin; 2 subpectorals, first or lower little behind upper and below pectoral fin base, upper close

before bases of lower pectoral fin rays; 6 ventrals, equidistant, same level; 1 supraventral, little above middle in space between lateral line and ventral fin base; 7+5 anals, last anteroanal slightly elevated, posteroanals behind anal fin base; 3 supraanals, first or lowest little above and behind last ventral, second elevated though little lower than supraventral opposite anal fin origin, third or uppermost close below lateral line over second; 1 posterolateral little below lateral line behind last anteroanal; 2 low close set

precaudals and 1 at end of lateral line. Supracaudal luminous plate 1 1/3 in eye, infracaudal equals eye. Many luminous whitish bodies scattered over head and body.

D. III, 11, I, first branched ray 1 3/5? to 1 7/8? in head; adipose fin 4 to 5 1/8; A. III, 11, I, first branched ray 1 1/2; caudal 1 1/8, forked; least depth of caudal peduncle 2 1/4 to 2 3/4; pectoral 1 3/4 to 3; ventral 2 1/10 to 2 1/5.

Blackish, with whitish blotches irregularly due to luminous blotches. Iris dark slate. Vertical fins dusky. Pectoral grayish. Ventral with inner rays whitish, outer dusky.

Gulf Stream. The figure of
Lampadena speculigera by Goode and
Bean is wrongly credited by them to
"Steamer Fish Hawk Station 797" when
it should have read Gloucester Station
797, Schooner "Alice G. Wonson" as given
in their list of plates and figures and
corrected by Mr. Barton A. Bean. Goode
and Bean evidently had the smaller
43796 in mind originally as their type
but later designate 43797, so that
this larger specimen becomes available.
It is in very poor condition so that few
of its characters can now be made
out.

4412

39479 U.S.N.M. N. 39° W. 70°

Albatross Collection. Length 146 mm.

Paratype.

43797 U.S.N.M. Georges Banks.

Schooner "Alice G. Wanson. Length 148

mm. Type.

43796 U.S.N.M. N. 39°48' W. 70°36'.

In 551 fathoms. Albatross Collection.

Length 48 mm. Paratype.

92117. U.S.N.M. Gully between

Browns and Georges Banks, from

Xiphias gladius stomach. Schooner

"Eleanor". Capt. Thomas Brigham. July 15-

August 5, 1931. Length 153 mm.

2267 -

4413

Lampadena chavesi Collett.

Lampadena chavesi Collett, Zool. Anzeiger, vol. 28, 1905, p. 728. Azores. — Regan, Brit. Antarctic "Terra Nova" Exped., Zool. vol. 1, 1916, p. 140, pl. 6, fig. 8 (N. 26°17' W. 20°54', 10 meters, south of Canaries). — Jaaning, Vidensk. Medd. Dansk. Naturh. Foren. Köbenhavn, vol. 86, 1928, p. 62 (north Atlantic). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. 149 (compiled).

Myctophum (Lampadena) chavesi Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee Fische, 1906, p. 210, fig. 129 (Azores). — Zugmayer, Res. Camp. Sci. Monaco, vol. 35, 1911, p. 29 (N. 36°5'30" W. 9°00'30", 3600 meters). — Pappenheim, Deutsch Südpolar Exped.,

vol. 15, Zool. 7, 1914, p. 194 (N. 17° 28' W. 29° 42', 1 west of Cape Verde). 3000 meters,

Depth 4 5/6; head 3 1/3. Snout 6 3/4 in head; eye 2 9/10, greater than snout; maxillary extends 1/2 eye diameter behind eye, slender, length 1 2/5 in head; interorbital very low.

Scales 39 in lateral line, cycloid.

Small antorbital luminous body slightly below middle of front eye edge; 2 opercular photophores, upper larger, in slightly upward inclined line from lower eye edge to pectoral fin origin; 3 branchiostegals; 5 pectorals, first interval much longest,

vol. 15, Zool. pt. 7, 1914, p. 194 (west of Cape Verde; 3000 meters).

all level except last which little elevated before ventral fin origin; 1 suprapectoral, little below lateral line, slightly before subpectorals; 2 subpectorals, rather close, one above other, upper close before bases of lower pectoral rays; 5 or 6 ventrals, level; 1 supraventral, midway between lateral line and ventral fin base; anals 7+2, last 2 or 3 anteroanals behind anal fin base, all anals level; 3 supraanals, in very slightly angulate

series also slightly inclined from vertical, first and second nearly in line with last ventral and equidistant, upper slightly advanced from median and close below lateral line; 1 posterolateral, close below lateral line little advanced from last anteroanal; 3 wide set precaudals, third at end of lateral line and slightly behind second which level with first. Long supracaudal and infracaudal luminous plates, latter extends from last anteroanals

to first precaudal.

D. II, 10, first branched ray 1 4/5 in head; adipose fin 3 1/6; A. II, 10, first branched ray 1 4/5; caudal 1 1/5, forked; least depth of caudal peduncle 2 2/5; pectoral 1 3/5; ventral 1 3/4.

Bluish black. Length 70 mm.
(Brauer.)

Atlantic Ocean.

2270

4418

Lampadena brauneri Zugmayer

Lampadena brauneri Zugmayer, Bull. Inst. Océanogr. Monaco, no. 288, 1914, p. 2. Station 3447, 1100 meters, 1913, one from stomach of Stomias boa Risso.

— Taaning, Vidensk. Medd. Dansk Naturh. Foren, København, vol. 86, 1928, p. 63 (diagnosis in key). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. 149 (compiled).

Eye medium, twice or more in maxillary. Distance from eye to pectoral twice long as distance from pectoral to dorsal origin.

Pectoral photophores all level; anals 6 to 8 + 2, posteroanals at

front end of infracaudal luminous plate; 2 supraanals, lower posterior to vertical line through upper (third supraanal evidently enters series between ventral and anal fins); precaudals 2 or 3 ± 1. Infracaudal luminous plate shorter than half distance from anal to caudal.

D. 14 or 15; A. 13 to 15. (Jaaning.)

North Atlantic.

2271

4420

Lampadena anomala Parr

Lampadena anomala Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. (149) 150, fig. 35. N. 32° 24' W. 64° 29', 10000 feet.

Depth 5 1/3; head 3 1/3. Snout 6 2/3 in head from snout tip; eye 4, greater than snout; maxillary extends eye diameter behind eye, slender, length 1 1/3 in head from snout tip; interorbital low, eye impinging on upper profile.

Scales 37 in lateral line.

Opercular photophores 6, equidistant, follow along and behind hind preopercle edge, uppermost level with lower

pupil edge; 7 pectorals, level,
second interval longest; 1 suprapectoral,
above upper third between lateral
line and pectoral origin and in
line with 2 subpectorals of which
upper before lower basal half of
pectoral, lower close below upper
posteriorly; 3 ventrals, level; 1
supraventral, about midway between
lateral line and ventral fin base;
anals 3 or 4 + 2 or 1, level, posteroanals
behind anal fin base, side by side;
2 supraanals, first or lower close

behind and posterior to last ventral, second or upper close below lateral line opposite anal fin origin; 1 posterolateral well below lateral line; 3 precaudals, lower 2 close, above lower rudimentary caudal rays, third elevated and posterior close below end of lateral line. Supracaudal and infracaudal plates rather small, equal.

D. 14; A. 14, origin below bases of last dorsal rays; least depth of caudal peduncle 2 2/3 in head;

pectoral 4; ventral 1 3/4.

Uniformly dark brown. Length without caudal 48 mm. (Parr.)

Western Atlantic.

2274 4424

Lampadena bathyphila Jaaning

Lampadena bathyphila Jaaning, Tidensk. Medd. Dansk Naturh. Foren. Kobenhavn, vol. 86, 1928, p. 63. North Atlantic (diagnosis in key). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. (150) 151, fig. 36 (N. 21° to 33° W. 64° to 77°, 7000 to 10000 feet).

Depth 5 1/2; head 3 1/2. Snout 8 1/2 in head; eye 3, greatly exceeds snout; maxillary extends 7/8 eye diameter behind eye, slender, length 1 1/3 in head; interorbital low, eye greatly impinging on upper profile.

Scales 35 in lateral line, deciduous.

Three very small photophores in close set series, close along hind eye edge; 2 operculars, upper larger and slightly above level of line from lower eye edge to upper subpectoral; 5 or 6 pectorals, level, first interval longest; 1 suprapectoral, slightly before subpectorals little nearer lateral line than pectoral fin origin; 2 subpectorals, one above other with lower slightly advanced, upper close before lower pectoral ray bases; 3 to 5 ventrals, level; 1

supraventral, about midway between lateral line and ventral fin origin; anals 3 + 1 or 2, level, posteroanal behind anal fin base; 1 or 2 supraanals, ~~where present~~ ~~both~~ close below lateral line also when both present; 1 posterolateral close below lateral line; 3 precaudals, first 2 side by side, low, upper or third posterior and close above end of lateral line. Supracaudal and infracaudal luminous plates large, half head length.

Uniformly deep brownish black.

Length without caudal 61 mm.

(Parr.)

Western Atlantic.

Lampadena minima Taaning

Lampadena minima Taaning, Vidensk. Medd. Dansk. Naturh. Foren. Köbenhavn, vol. 86, 1928, p. 63. North Atlantic (diagnosis in key). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, 1928, p. (150) 154, fig. 37 (N. 32° 19' W. 64° 33', 8000 feet). — Borodin, Bull. Mus. Comp. Zool., vol. 72, no. 3, Aug. 1931, p. 77 (N. 33° 50' W. 63° 55', 1500 meters; N. 32° 50' W. 64° 18', 1500 meters).

Eye large, less twice in maxillary
twice or more in body depth at pectoral fin.
length, 1/1 space from eye to pectoral
nearly equals space from pectoral origin
to dorsal origin. Space from pectoral
origin to anal origin equals space from
anal origin to caudal base.

Ventral photophores 8 (apparently
lower and median supraanals); anals
6 + 4 or 5, 3 posteroanals along front
end of infracaudal luminous plate;
1 supraanal, at lateral line;
2 + 1 precaudals.

D. 11 or 12, origin premedian; A. 11 or
12.

(Jaaning.)

North Atlantic.

89907 U.S.N.M. N. 35° 50' W. 63° 53'.
Museum of Comparative Zoology (46).
Length 20 mm. This poorly preserved
specimen was received under the
present name though few of its
characters may now be made out.

D. 5387. Bagatao Island Light (outer), S. 80° E., 27 miles (12° 54' 40" N., 123° 20' 30" E.), between Burias and Luzon, in 209 fathoms. March 11, 1909. Length 103 mm.

4431

Lampradena luminosa (Garman)

Myctophum luminosum Garman, Mem. Mus. Comp. Zool., vol. 24, 1899, p. 263, pl. 55, fig. 2. Galapagos Islands, N. Lat. 0°57' 30" W. Long. 89°3' 30", in 421 fathoms. —

Weber and Beaufort, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 172, fig. 66 (compiled).

Myctophum (Lampanyctus) luminosum Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 5, Tiefsee-Fische, 1906, p. 208, text fig. 128 (west coast of Sumatra; between Chagos Archipelago and Seychelles).

Lampa~~nyctus~~ dena luminosa Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928,

→ p. 155 (Atlantic material).

↑ — Borodin, Bull. Mus. Comp. Zool., vol. 72, No. 3, Aug. 1931, p. 77 (N. 33°50' W. 63°55', 1500 meters; N. 33° W. 64°, 1200 meters; N. 37° W. 67°12', 1500 meters).

Atlantic (diagnosis in key).

Depth 4 2/5 to 4 1/2; head 3 to 3 3/4, width 2 to 2 1/8. Snout 6 1/4? to 8 in head; eye 4 3/5 to 4 3/4, greater than snout; maxillary extends back behind eye 1 1/2 eye diameters but not to well inclined hind preopercle edge, slender, length 1 1/3? to 1 1/2 in head; interorbital low, damaged.

Scales 35 to 38 in lateral line to caudal base, not enlarged; 3 above, 4

→ p. 155 (Atlantic material).

Lampanyctus luminosa nitida Taaning,

Vidensk. Medd. dansk. naturh. Foren.

København, vol. 86, 1928, p. 62. North

Atlantic (diagnosis in key).

Depth 4 2/5 to 4 1/2; head 3 to 3 3/4,

width 2 to 2 1/8. Snout 6 1/4? to 8 in head;

eye 4 3/5 to 4 3/4, greater than snout;

maxillary extends back behind eye 1 1/2

eye diameters but not to well inclined

hind preopercle edge, slender, length 1 1/3?

to 1 1/2 in head; interorbital low,

damaged.

Scales 35 to 38 in lateral line to

caudal base, not enlarged; 3 above, 4

below, 12 predorsal forward to occiput. Caudal base scaly. Scales very caducous, most all fallen.

Small upper photophore at front eye edge; 2 opercular, upper larger and on line with lower eye edge and pectoral fin origin, lower close behind maxillary end; 3 equidistant veiled branchiostegals; 5 pectorals, fourth elevated and over third, interspace between first and second twice length of other interspaces; 1 suprapectoral, before pectoral fin origin and closer to lateral line; 2 subpectorals, lower little behind suprapectoral though nearer

upper subpectoral than third pectoral and about same level as fourth pectoral, upper spot opposite mid pectoral fin base, though little behind lower; 5 ventrals; 1 supraventral, midway between lateral line and ventral fin base; 5 + 2 anals, posteroanals well all, 1 behind anal fin base; 3 supraanals, first and second close, though both behind last ventral and second little higher than first, third close below lateral line nearly opposite anal fin origin; 1 posteroanal close below lateral line and over break in anals or behind anal base;

4 precaudals, first 3 close and on same level along lower edge of tail, last at end of lateral line on caudal base. Large supracaudal and another infracaudal luminous plate.

D. III, 11, I or III, 12, I, first branched ray 1 2/5 to 1 3/5 in lead; adipose fin 5 to 7 1/4; A. III, 10, I, first branched ray 2 to 2 1/10; caudal 1 1/5 to 1 1/4?, deeply forked; least depth of caudal peduncle 2 1/2 to 3 1/8; pectoral 1 1/4 to 1 1/3; ventral 1 4/5 to 2.

Brown, scale pockets dusky. Opercle blackish, also inside gill opening. Iris dark gray. Fins all

pale brownish.

D. 5387. Bagatao Island Light (outer), S. 80°E., 27 miles (N. 12°54'40"E. 123°20'30"), between Burias and Luzon. In 209 fathoms. March 11, 1909. Length 10.3 mm.

D. 5250. Linao Point, N. 22°E., 1.1 miles (N. 7°5'7"E. 125°39'45"), Gulf of Davao. May 18, 1908. Length 12.8 mm., head damaged.

D. 5190. Pescador Island, S. 9°E., 10.70 miles (N. 10°8'15"E. 123°16'45"), Tanon Strait, east coast of Negros. In 295 fathoms. April 1, 1908. Length 26 to 32 mm. 3 examples.

Genus Neoscopelus Johnson

Neoscopelus Johnson, Proc. Zool. Soc. London, 1863, p. 44. Type Neoscopelus macrolepidotus Johnson, monotypic.

Body oblong, compressed, somewhat robust. Head conic. Snout depressed, rather long. Maxillary expanded terminally, with small supplemental bone. Upper mouth border formed entirely of premaxillary each side. Mouth cleft wide, oblique, not nearly reaching preopercle angle. Lower jaw slightly protruded. Teeth in bands in jaws, on palatines, vomer and also patches on ectopterygoids. Gill membranes separated,

slightly overlap at chin. Gill rakers long, slender. Pseudobranchial large. Branchiostegals 8 or 9. Air bladder large. Scales large, cycloid, caducous, with photophores below, on surfaces of each with minute spinules. Luminous glands on head and mandibular rami. Lateral line present. Dorsal origin over ventral origin, fin short, premedian in body. Adipose fin present. Anal short, behind dorsal or origin well postmedian. Caudal forked. Pectoral long, lateral, lower rays not especially thick, reach middle of body. Ventral short.

Neoscopelus macrolepidotus Johnson

Neoscopelus macrolepidotus Johnson, Proc. Zool. Soc. London, 1863, p. 44, pl. 7. Madeira. — Alcock, Ann. Mag. Nat. Hist., ser. 6, vol. 8, 1891, p. 129 (Andaman Sea, in 188 to 220 fathoms). — Goode and Bean, Oceanic Ichth., 1895, p. 93, pl. 29, figs. 108-109 (Atlantic material). — Alcock, Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 333 (reference). — Gilbert and Cramer, Proc. U. S. Nat. Mus., vol. 19, 1897, p. 414 (Hawaii, in 343 to 375 fathoms). — Alcock, Cat. Deep Sea Fish. Indian Mus., 1899, p. 164 (Andaman Sea, in 188 to 405 fathoms; Arabian Sea off Travancore

coast, in 360 fathoms). — Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 691 (off Molokai; French Frigates shoal; Bird Island; Kauai; west of Hawaii; in 222 to 800 fathoms). — Brauer, Deutsch. Tiefsee-Fische, Tiefsee Exped. Valdivia, vol. 5, 1906, p. 147, text figs. 72-76, pl. 11, figs. 2-3 (off west coast of Sumatra; east coast of Africa; in 614 to 693 meters). — Waite, Records Canterbury Mus., vol. 1, no. 1, April 25, 1907, p. 13 (reference). — Regan, Trans. Linn. Soc. London, ser. 2, vol. 12, Zool., pt. 3, 1908, p. 219 ( ). — Weber, Siboga Exped., vol. 57, Fische, 1913, p. 83 (Madura, Flores, Arafura, Timor, Bali seas, in

289 to 709 meters). — Gilbert, Mem. Carnegie Mus., vol. 6, No. 2, August 1913, p. 69 (Sagami Bay). — Mc Culloch, Biolog. Res. Endeavour, vol. 2, pt. 3, July 3, 1914, p. 90, pl. 17 (Great Australian Bight, in 350 to 450 fathoms). — Weber and Beaufort, Fishes Indo-Austral. Archipelago, vol. 2, 1913, p. 174, fig. 67 (Weber's materials). — Waite, Records South Australian Mus., vol. 2, No. 1, 1921, p. 45, fig. 66. — Gilchrist, Rep. Fisher Marine Biol. Surv. South Africa, vol. 2, 1921, p. ( ); Fish. Marine Surv. South Africa, Special Rep. No. 3, 1922, p. 56 ( ). — Jordan and Jordan, Mem. Carnegie Mus., vol. 10,

no. 1, dec. 1922, p. 10 (reference). — Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 246 (off Cape Morgan and Natal coast, in 174 to 290 fathoms). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, dec. 1928, p. 48 (compiled). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 70 (Hawaii).

Scopelus macrolepidotus Günther, Cat. Fishes Brit. Mus., vol. 5, 1865, p. 414 (type); Rep. Voy. Challenger, vol. 22, 1887, p. 196 (Kermadec Islands, in 520 to 630 fathoms).

Neoscopelus alcocki Jordan and Starks, Bull. U. S. Fish Comm., vol. 2, 1902 (1904), p. 580, pl. 2, figs. 1–2. Suruga Bay, in 173 to 260 fathoms

Depth 4 1/6 to 5; head 2 4/3 ? to 3, width 2 1/4 to 2 1/3. Snout 3 3/4 to 3 7/8 in head from snout tip; eye 3 1/2 to 5 4/5, subequal with snout in young to 2 in snout with age, subequal with interorbital in young to 1 1/2 with age; maxillary reaches hind eye edge or slightly beyond, expansion 1 to 1 1/2 in eye, length 1 4/5 to 2 in head from snout tip; interorbital 3 2/5 to 3 7/8, low, but slightly convex. Gill rakers 2 to 5 + 10, also with 2 or 3 rudimentary bony tubercles above and below, lanceolate, equal eye; gill filaments 3/5 of gill rakers.

Scales 30 to 33 in lateral line to

caudal base, 4 above, 4 below, 14 or 15 predorsal to occiput. Scales very caducous, all fallen.

Pectoral photophores in 5 longitudinal series, also 1 or 2 short parallel rows before pectoral base; pectorals also continued as 5 rows of ventrals though only 2 rows each side above anal base and this giving way behind anal or about middle of caudal peduncle only to lower row which persistent to lower caudal base.

D. $\frac{IV}{=}$, 8, $\frac{I}{=}$ or $\frac{IV}{=}$, 9, $\frac{I}{=}$, first branched ray 1 1/5 to 1 1/2 in total head length; adipose fin 4 2/5 to 4 2/3; A. $\frac{III}{=}$, 9, $\frac{I}{=}$ or $\frac{III}{=}$, 10, $\frac{I}{=}$,

first branched ray 2 1/8 to 2 1/5; caudal 1 2/3 to 1 3/4, forked, rudimentary rays 8 or 9 and inconspicuous; least depth of caudal peduncle 3 1/4 to 3 3/5; pectoral 1 to 1 1/8; ventral 1 3/5 to 2.

Brown, variably russet or light brown to dusky or neutral dusky or even blackish. Scales where present and sides of head, though also sometimes whole lateral regions even where scales denuded brilliant silvery white. Iris gray to silvery white. Opercles sometimes with violet or emerald tints. Fins pale brown to whitish. Photophores silvery white with narrow dark encircling

borders.

D. 5216. Anima Sola Island, N. 44° W., 29. 50 miles (N. 12° 52' E. 123° 23' 30"), between Burias and Luzon. In 215 fathoms. April 22, 1908. Length 140 mm).

2616. D. 5535. Apo Island (C.), S. 24° W., 17 miles (N. 9° 20' 30" E. 123° 23' 45"), between Cebu and Siquijor. In 310 fathoms. August 19, 1909. Length 157 mm.

2044, D. 5536. Apo Island (C.), S. 26° W., 11.8 miles (N. 9° 15' 45" E. 123° 22'), between Negros and Siquijor. In 279 fathoms. August 19, 1909. Length 180 mm.

1533 to 1535. D. 5537. Apo Island (C.), S. 46° W., 8.7 miles (N. 9° 11' E. 123° 23'), between Negros and Siquijor. In 254 fathoms. August 19, 1909. Length 37 to 213 mm.

1946 to 1948.

D. 5445. Atalaya Point, Batag Island, S. 56° E., 5.3 miles (N. 12° 44' 42' E. 124° 59' 50"), east coast of Luzon. In 383 fathoms. June 3, 1909. Length 97 to 115 mm.

3705 & 3707.

D. 5387. Bagatao Island Light (outer), S. 80° E., 27 miles (N. 12° 54' 40" E. 123° 20' 30"), between Burias and Luzon. In 209 fathoms. March 11, 1909. Length 41 to 130 mm. 4 examples.

3763. D. 5388. Bagatao Island Light (outer), S. 86° E., 21 miles (N. 12° 51' 30" E. 123° 26' 15"), between Burias and Luzon. In 226 fathoms. March 11, 1909. Length 162 mm.

June 3, 1908. Length 130 to 175 mm.

4031. D. 5527. Balicasag Island (C.), N. 14° W., 8.2 miles (N. 9° 22' 30" E. 123° 42' 40"), between Siquijor and Bohol. In 392 fathoms. August 11, 1909. Length 247 mm.

3525, 3526, 8474, 10153. D. 5424. Cagayan Island (S.), S. 11° W., 3.4 miles (N. 9° 37' 05" E. 121° 12' 37"), Jolo Sea. In 340 fathoms. March 31, 1909. Length 195 to 240 mm.

3705 & 3707.

D. 5387. Bagatao Island Light (outer), S. 80° E., 27 miles (N. 12° 54' 40" E. 123° 20' 30"), between Burias and Luzon. In 209 fathoms. March 11, 1909. Length 41 to 130 mm. 4 examples.

2783 and 2784. D. 5260. Balanja Point, N. 28° W., 7.20 miles (N. 12° 25' 35" E. 121° 31' 35"), off southeastern Mindoro. In 234 fathoms. June 3, 1908. Length 130 to 175 mm.

4031. D. 5527. Balicasag Island (C.), N. 14° W., 8.2 miles (N. 9° 22' 30" E. 123° 42' 40"), between Siquijor and Bohol. In 392 fathoms. August 11, 1909. Length 247 mm.

2 1

3525, 3526, 8474, 10153. D. 5424. Cagayan Island (S.), S. 11° W., 3.4 miles (N. 9° 37' 05" E. 121° 12' 37"), Jolo Sea. In 340 fathoms. March 31, 1909. Length 195 to 240 mm.

D. 5190. Pescador Island, S. 9° E.,
10.70 miles (10°08'15" N., 123°16'45" E.),
Tenon Strait east coast of Negros,
in 295 fathoms. March 31, 1908.
Length 54 to 58 mm'. 2 examples.

1 example. Varadero Bay. July 23,
1908. Electric light 12.30 A.M. to 1.45 A.M.
Length 42 mm.

D. 5437. Hermana Mayor Light, N. 69°
E., 4.9 miles (15°45'54" N. 119°42'45" E.),
west coast of Luzon, Manila Bay to Lingayen
Gulf. May 8, 1909. Length 32 mm.

2190. D.5329. Font Island (W.), N.28° E., 24.25 miles (N.18°33'E.121°37'30"), off northern Luzon. In 212 fathom. November 19, 1908. Length 59 mm.

2683. D.5172. Jolo Light, E., 24.75 miles (N. 6° 3' 15" E. 120° 35' 30"), vicinity of Jolo. In 318 fathoms. March 5, 1908. Length 160 mm.

2872. D.5551. Jolo Light (E.), N.60°E., 18 miles (N. 5°54'48"E. 120°44'24"), Jolo Island and vicinity. In 193 fathoms. September 17, 1909. Length 112 mm.

3276, 3277, 3291, 3292, 3294. D.5625. Kayoa Island (SE.), S. 3°W., 6 miles (N.0° 7'E. 127°28'), between Gilolo and Kayoa Islands. In 230 fathoms. November 29, 1909. Length 145 to 181 mm.

3792 to 3795, 4129, 4130. D.5626. Kayoa Island (S.E.), S. 5° W., 6.7 miles (N. 0° 7' 30" E. 127° 29'). In 265 fathoms. November 29, 1909. Length 145 to 182 mm.

3081. D.5412. Lauis Point Light, N. 21° E. 5.5 miles (N. 10° 9' 15" E. 123° 5' 2"), between Cebu and Bohol. In 162 fathoms. March 23, 1909. Length 109 mm.

1920. D.5417. Lauis Point Light, N. 10° E., 3.5 miles (N. 10° 10' E. 123° 5' 3' 15"), In 165 fathoms. March 25, 1909. Length 176 mm.

3364. D. 5421. Lusaran Point Light, S. 27° E., 5 miles (N. 10° 33' 30" E. 122° 26'), between Panay and Guimaras. In 137 fathoms. March 30, 1909. Length 75 mm.

1614, 1653 to 1662. D. 5589. Inabul Island (N.W.) N. 3° W., 2.8 miles (N. 4° 12' 10" E. 118° 38' 8"), Sibuko Bay, Borneo, and vicinity. In 200 fathoms. September 29, 1909. Length 128 to 203 mm.

1621 to 1624. D. 5590. Inabul Island (N.W.), N. 22° W., 4.3 miles (N. 4° 10' 50" E. 118° 39' 35"). In 310 fathoms. September 29, 1909. Length 163 to 197 mm.

2603. D.5501. Macabalan Point Light (Mindanao), S. 35° E., 8. 2 miles (N. 8° 37' 37" E. 124° 35'), northern Mindanao. Dn 214 fathoms. August 4, 1909. Length 111 mm.

3514.

2017, 1 D. 5502. Macabalan Point Light (Mindanao), S. 35° E., 8. 2 miles (N. 8° 37' 37" E. 124° 35"). Dn 214 fathoms. August 4, 1909. Length 55 to 200 mm. 13 examples.

1677 to 1679, 2439, 3159. D. 5503.

Macabalan Point Light (Mindanao), S. 31° E., 6.6 miles (N. 8° 36' 26" E. 124° 36' 8"). Dn 226 fathoms. August 4, 1909. Length 52 to 203 mm. 40 examples.

2444. D. 5504. Macabalan Point Light (Mindanao), S. 39° E., 6 miles (N. 8° 35' 30" E. 124° 36'). Dn 200 fathoms. August 5, 1909. Length 152 mm.

1912 to 1914, 10149, 10150. D. 5505. Macabalan Point Light (Mindanao), S. 31° E., 7.7 miles (N. 8° 37' 15" E. 124° 36'). In 220 fathoms. August 5, 1909. Length 200 to 233 mm.

10209. D. 5506. Macabalan Point Light (Mindanao), S. 41° E., 12.2 miles (N. 8° 40" E. 124° 31' 45"). In 262 fathoms. August 4, 1909. Length 215 mm.

↑ D. 5622. Makayan Island (N.E.), N. 66° W., 4.1 miles (N. 0° 19' 20" E. 127° 28' 30"). In 275 fathoms. November 29, 1909. Length 170 mm.

Makayan. In 288 fathoms. November 29, 1909. Length 56 to 185 mm.

1912 to 1914, 10149, 10150. D. 5505. Macabalan Point Light (Mindanao), S. 31° E., 7.7 miles (N. 8° 37' 15" E. 124° 36'). In 220 fathoms. August 5, 1909. Length 200 to 233 mm.

10209. D. 5506. Macabalan Point Light (Mindanao), S. 41° E., 12.2 miles (N. 8° 40" E. 124° 31' 45"). In 262 fathoms. August 4, 1909. Length 215 mm.

4100, 4103, 4104, 4114. D. 5624. Malayan Island (S.), N. 67° W., 8.9 miles (N. 0° 12' 15" E. 127° 29' 30"), between Gillolo and Malayan. In 288 fathoms. November 29, 1909. Length 56 to 185 mm.

4150 to 4151, 4153 to 4156. D. 5622. Malayan Island (N.E.), N. 66° W.. In 275 fathoms). November 29, 1909. Length 136 to 160 fathoms).

1651. D. 5122. Malabrigo Light, N. 14° W., 9 miles (N. 13° 27' 20" E. 121° 17' 45"), east coast of Mindoro. In 108 fathoms. February 2, 1908. Length 208 mm.

Luzon. In 525 fathoms. July 16, 1908. Length 167 mm.

D. 5280. Malavatuan Island (N.), S. 60° W., 6.10 miles (N. 13° 55' 20" E. 120° 25' 55"). In 193 fathoms. July 17, 1908. Length 78 to 153 mm. 13 examples.

D. 5281. Malavatuan Island (N.), S. 84° W., 4.30 miles (N. 13° 52' 45" E. 120° 25"). In 201 fathoms. July 18, 1908. Length 103 to 170 mm. 9 examples.

4150 to 4151, 4153 to 4156. D. 5622. Malayan Island (N.E.), N. 66° W.. In 275 fathoms). November 29, 1909. Length 136 to 160 fathoms).

2757. D. 5274. Malavatuan Island (N.), S. 73° 30' E., 17.50 miles (N. 13° 57' 30" E. 120° 03' 25"), China Sea, vicinity southern Luzon. In 525 fathoms). July 16, 1908. Length 167 mm.

D. 5280. Malavatuan Island (N.), S. 60° W., 6.10 miles (N. 13° 55' 20" E. 120° 25' 55"). In 193 fathoms). July 17, 1908. Length 78 to 153 mm). 13 examples.

D. 5281. Malavatuan Island (N.), S. 84° W., 4.30 miles (N. 13° 52' 45" E. 120° 25"). In 201 fathoms). July 18, 1908. Length 103 to 170 mm). 9 examples.

10097. D.5282. Malavatuan Island (N.), S. 84° W., 6.20 miles (N. 13° 53' E. 120° 26' 45"). In 248 fathoms. July 18, 1908. Length 185 mm.

D.5268. Matocot Point, S., 50° E., 5.80 miles (N. 13° 42' E. 120° 57' 15"), Verde Island Passage and Batangas Bay. In 170 fathoms. June 8, 1908. Length 125 to 140 mm. 3 examples.

10109. D.5290. Matocot Point, S. 50° E., 3.10 miles (N. 13° 40' 09" E. 120° 59' 30"), China Sea, vicinity southern Luzon. In 214 fathoms. July 22, 1908. Length 145 mm.

D.5297. Matocot Point, S. 50° E., 5.10 miles (N. 13° 41' 20" E. 120° 58'), In 198 fathoms. July 24, 1908. Length 104 mm.

4094. D. 5656. Olang Point, N. 67° W., 14.5 miles (S. 3° 17' 40" E. 120° 36' 45"), Gulf of Boni, Celebes. In 484 fathoms. December 19, 1909. Length 198 mm.

2772. D. 5124. Point Origon (N.), S. 56° E., 20.75 miles (N. 12° 52' E. 121° 48' 30"), east coast of Mindoro. In 281 fathoms. February 2, 1908. Length 120 mm.

3545. D. 5348. Point Tabonan, S. 89° E., 33.5 miles (N. 10° 57' 45" E. 118° 38' 15"), Palawan Passage. In 375 fathoms. December 27, 1908. Length 180 mm.

3802. D. 5517. Point Tagolo Light, S. 83° W., 10.5 miles (N. 8° 45' 30" E. 123° 33' 45"), northern Mindanao and vicinity. In 169 fathoms. August 9, 1909. Length 178 mm.

1987, 3934. D. 5221. San Andreas Island (W.), S. 27° E., 5.50 miles (N. 13° 15' 38" E. 121° 15' 48"), between Marinduque and Luzon. In 193 fathoms. April 24, 1908. Length 130 to 192 mm.

2424, 2566. D. 5442. San Fernando Point Light, N. 39° E., 8.4 miles (N. 16° 30' 36" E. 120° 11' 06"), west coast of Luzon. In 45 fathoms. May 10, 1909. Length 150 to 154 mm.

3672. D. 5441. San Fernando Point Light, S. 87° E., 18.7 miles (N. 16° 38' E. 119° 57' 18"). In 186 fathoms. May 10, 1909. Length 93 mm.

2123. D. 5460. Dialat Point Light, N. 24° E., 8.2 miles (N. 13° 32' 30" E. 123° 58' 06"), east coast of Luzon. In 565 fathoms. June 10, 1909. Length 145 mm.

2246, 2247. D. 5463. Sialat Point Light, S. 74° E., 3.9 miles (N. 13° 40' 57" E. 123° 57' 45"). In 300 fathoms. June 16, 1909. Length 166 to 207 mm. 3 examples.

D. 5111. Sombrero Island, S. 41° E., 4.50 miles (N. 13° 45' 15" E. 120° 46' 30"), China Sea off southern Luzon. In 236 fathoms. January 16, 1908. Length 84 to 117 mm. 8 examples.

1749. D. 5112. Sombrero Island, S. 18° E., 6.75 miles (N. 13° 48' 22" E. 120° 47' 25"), In 177 fathoms. January 17, 1908. Length 131 mm.

4506. D. 5368. Tayabas Light (outer), N. 32° W., 21.8 miles (N. 13° 35' 30" E. 121° 48'), Marinduque Island and vicinity. In 181 fathoms. February 23, 1909. Length 130 mm.

3738, 3739. D. 5371. Tayabas Light (outer), N. 43° W., 6 miles (N. 13° 49' 40" E. 121° 40' 15"). In 83 fathoms. February 24, 1909. Length 185 to 197 mm.

2179. D. 5374. Tayabas Light (outer), N. 9° E., 7.4 miles (N. 13° 46' 45" E. 121° 35' 08"). In 190 fathoms. March 2, 1909. Length 94 to 145 mm. 26 examples.

44602 U. S. N. M. N. 29° 3' 15" W. 88° 16'. February 11, 1885. Albatross Collection (7376). Length 80 to 165 mm. 4 examples.

47635 U. S. N. M. Off Martinique. In 357 fathoms. Steamer Blake XLII. Length 166 mm.

47712 U.S.N.M. N. 21°8'30" W. 157° 49'; off Hawaiian Islands. December 4, 1891. Albatross Collection (3470). Length 185? to 205? mm. 2 examples.

47725 U.S.N.M. N. 21°12' W. 157°38'30"; off Hawaiian Islands. December 6, 1891. Albatross Collection (3474). Length 96 to 120mm? 2 examples.

47736 U.S.N.M. N. 21°8'30" W. 157°49'; off Hawaiian Islands. September 4, 1889. Albatross Collection (3470). Length 155 to 175? mm. 3 examples.

83882 U.S.N.M. December 14, 1887. Albatross Collection (2756). Length 110 to 165 mm? 2 examples.

2293

4462

Genus Scopelopsis Braner

Scopelopsis Braner, Deutsch. Tiefsee Tiefsee-Fische, Exp. Valdivia, vol. 15, 1, 1906, p. 146. Type Scopelopsis multipunctatus Braner, monotypic.

Body elongate, tapers back from head. Head large, forms greatest body depth. Eye large, smaller with age. Maxillary reaches beyond middle of head, very slightly expanded posteriorly. Opercles large. Pseudobranchiae present. Branchiostegals 9 or 10. Air bladder well developed. Scales with denticulate edges. Small photophore below each

scale. Dorsal origin premedian. Adipose fin present. Anal begins below middle of dorsal, fin similar to dorsal. Caudal emarginate. Pectoral little shorter than ventral.

Allied with Myctophum but differing chiefly in the presence of a small photophore below every scale on body.

4464

Scopelopsis multipunctatus Brauer

Scopelopsis multipunctatus Brauer,
Deutsch. Tiefsee Exped. Valdivia, vol. 5,
Tiefsee-Fische
1, 1906, p. 146, text fig. 71. Cape Colony
(N. Lat. 33° 23' 4" E. Long. 16° 19' 4', in 2000
meters). — Barnard, Ann. South African
Mus., vol. 21, pt. 1, June 1925, p. 246 (off
Cape Point, in 800 to 1000 fathoms; off
Cape Morgan, in 480 fathoms; Agulhas
Banks). — Parr, Bull. Bingham Oceanog.
Collection, vol. 3, art. 3, Dec. 1928, p. 49
(compiled). — Norman, Discovery Rep.,
vol. 2, 1930, p. 318 (S. 33° 50' to 34° 13' E.
16° 4' to 15° 49', 850 to 950 meters).

4465

Depth 4 3/4 to 5; head 3 1/5 to 3 3/4. Snout 4 1/3 in head, with median ridge; eye 3 1/3 to 3 7/8, slightly greater than snout in young to nearly 2 in snout with age, 1 1/3 in interorbital; maxillary reaches well beyond eye, length 1 3/5 in head; interorbital low.

Scales 37 or 38 in lateral line, 3 above, 4 below.

Photophores 1 below each scale over whole body, similar ones around orbit, on lower jaw, branchiostegal membrane, isthmus and caudal

fin; with age elongate luminous patch on upper edge of caudal pedunde between adipose fin and caudal fin base.

D. 21 or 22, first branched ray 1 7/8 in head; adipose fin about equals eye; A. 23 to 25; first branched ray 1 4/5 in head; caudal 1 4/5; least depth of caudal peduncle 3; pectoral reaches ventral base, with second uppermost ray prolonged, reaches midway between ventral base and vent; ventral rays 8.

4467

Dark brown, fins lighter.

Reaches 75 mm. (Brauer, Barnard.)

Off South Africa.

4468

Genus Scopelengys Alcock

Scopelengys Alcock, Ann. Mag. Nat. Hist., ser. 6, vol. 6, 1890, p. 302. Type Scopelengys tristis Alcock, monotypic.

4469

Body compressed, deepest anteriorly, tapering backward. Caudal peduncle rather long or least depth less than half its length. Head large, compressed. Snout rather long. Eye small. Maxillary expanded posteriorly. Mouth very wide. Teeth in bands in jaws. Gill covers united. Long close set gill rakers. Pseudobranchiae rudimentary, of 3 or 4 small filaments each side. Scales very deciduous. Dorsal median, short.

No air bladder. Pyloric appendages 8.

Caudal forked. Pectoral well developed, low. Ventral short, nearer pectoral than anal.

According to Alcock very closely related to Notoscopelus, differing in the smaller eye, rudimentary pseudobranchiae and absence of air bladder.

Scopelengys tristis Alcock

Scopelengys tristis Alcock, Ann. Mag. Nat. Hist., ser. 6, vol. 6, 1890, p. 303. Off Elicapeni Bank, Laccadive Sea (N. Lat. 11°12'47" E. Long. 74°25'30", in 1000 fathoms); Illustrat. Zool. Investigator, Fishes, pt. 1, 1892, pl. 7, fig. 7; Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 333 (reference); Cat. Deep Sea Fish. Indian Mus., 1899, p. 166 (Arabian Sea; Laccadive Islands, 1000 fathoms). — Goode and Bean, Oceanic Ichth., 1895, pp. 93, 512 (reference). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 1928, p. 48 (note).

Scopelengys dispar Garman, Mem. Mus. Comp. Zool., vol. 24, 1899, p. 254, pl. 54, fig. 2. 7-d. N. Lat. 6° - 7° W. Long. 79° - 80°, in 695 to 1832 fathoms (Gulf of Panama).

- Townsend and Nichols, Bull. Amer. Mus. Nat. Hist., vol. 52, art. 1, May 16, 1925, p. 11 (off Point San Bartholome, Lower California, 480 fathoms; N. Lat. 25° to 28°; 735 fathoms).

Depth 4 1/5 to 4 3/5; head 2 4/5 to 3 1/8, width 2 1/4 to 2 2/5. Snout 3 3/4 to 4 in head from snout tip; eye 5 1/5 to 6, 1 1/3 to 1 1/2 in snout, 1 1/5 to 1 1/2 in interorbital; maxillary extends 4/5 to 1 eye diameter beyond eye, expansion 1 1/8 in eye, length 1 3/4 to 1 5/6 in head from snout tip; interorbital 4 1/4 to 4 1/3, low, broadly convex. Gill rakers 6+14, slender, lanceolate, 1 1/8 in eye.

Scales 38 to 40 in lateral line to caudal base, though not enlarged;

5 above, 4 below; 27 or 28 predorsal. Scales with 30 to 35 irregular short apical spinules; circuli very fine, not extended apically.

D. III, 10, I, first branched ray 1 2/3 to 1 4/5 in total head length; adipose fin 4 2/3 to 4 3/4; A. II, 7, I or II, 8, I, first branched ray 2 2/3 to 3 1/4; caudal 1 3/4 to 1 4/5, forked; least depth of caudal peduncle 3 3/4 to 4 2/5; pectoral 1 1/2 to 1 3/5; ventral 1 4/5 to 2.

Brown, nearly uniform. Iris gray. Fins all pale brown to whitish, caudal sometimes gray.

Gulf of Panama, Arabian Sea, Philippines.

3502 to 3505. D. 5526, Balicasag Island (C.), N. 15° W., 18.4 miles (N. 9° 12' 45" E., 123° 45' 30"), between Siquijor and Bohol. In 805 fathoms. August 11, 1902. Length 178 to 233 fathoms.

2152. D. 5515. Camp Overton Light, S. 26° E., 24.6 miles (N. 8° 34' 48" E., 124° 1' 24"), northern Mindanao and vicinity. August 8, 1909. Length 210 mm..

9173. D. 5491. Quiata Point (W.), S. 9° W., 19.3 miles (N. 9° 24' ~~W~~ E. 125° 12'), between Leyte and Mindanao. Dn 736 fathoms. August 1, 1909. Length 318 mm.

9181 to 9183. D. 5492. Quiata Point (W.), S. 45° W., 15.2 miles (N. 9° 12' 45" E. 125° 20'), between Leyte and Mindanao. Dn 735 fathoms. August 1, 1909. Length 235 to 245 mm.

9186 to 9189. D. 5494. Quiata Point (N.), N. 74° W., 4.2 miles (N. 9° 6' 36" E. 125° 18' 40"), between Leyte and Mindanao. Dn 678 fathoms. August 2, 1909. Length 308 to 344 mm.

9195. D. 5495. Quiata Point (N.), S. 76° E., 9.4 miles (N. 9° 6' 30" E. 125° 00' 20"), between Leyte and Mindanao. Dn 976 fathoms. August 2, 1909. Length 255 mm.

opening very wide.

D. I, II, first branched ray longest and 2 4/5 in total head length; A. 13, first branched ray 3 2/3, begins behind depressed dorsal; adipose fin 3 3/4; caudal 1 2/3, lobes pointed; least depth of caudal peduncle 3 7/8; pectoral 1 9/10; ventral 3 1/8.

Uniform blackish. Length 171 mm.

(Alcock.)

Arabian Sea and Gulf of Panama.

5473. D. 5203. Linapacan Island (S.), S. 38° W., 5.50 miles (N. 9° 58' E. 125° 7' 40"), Dogod Bay, southern Leyte. In 775 fathoms. April 10, 1908. Length 265 mm.

9156 to 9158. D. 5487. San Ricardo Point (Panaon Island), S. 50° E., 11.2 miles (N. 10° 2' 45" E. 125° 5' 33"), between Leyte and Mindanao. In 732 fathoms. July 31, 1909. Length 265 to 321 mm.

9161 to 9170. D. 5488. San Ricardo Point (Panaon Island), S. 59° E., 9 miles (N. 10° E. 125° 6' 45"), between Leyte and Mindanao. In 772 fathoms. July 31, 1909. Length 240 to 288 mm.

D. 5428.

4492 and 4493. Thirtieth of June Island, N. 62° W., 19.5 miles (N. 9° 13' E. 118° 51' 15"), eastern Palawan and vicinity. In 1105 fathoms. April 3, 1909. Length 120 to 126 mm.

Depth 5; head 3 2/5. Snout 3 1/3 in head from snout tip; eye 8 2/3, 2 1/3 in snout; maxillary reaches little beyond eye, expansion greater than eye or 5 1/2 in head from snout tip, length 2; mouth wide, very oblique; teeth villiform, acute, in rather broad bands, uncovered by lips, in premaxillary and mandible, in narrow bands on palatines and small patch each side of head of vomer; tongue toothless; interorbital low. Gill

4478

87561 U.S.N.M. California.

Albatross Station D. 5687.

April 23, 1911.

Length 138 mm.

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PHILADELPHIA, PA.

Bathytroctes (Talismania) homopterus Goode and Bean, Oceanic Ichth., 1895, p. 43 (copied).

Bathytroctes poroscopus Brauer, Verhand. Deutsch. Zool. Gesell., vol. 12, 1902, p. 43.